"OFFICIAL JOURNAL OF THE UNITED STATES ATV SOCIETY"

AMATEUR TELEVISION MAGAZINE™

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SPACE SHUTTLE 51-H MISSION SSTV LOOKS GOOD

WA2CXW TAKES FIRST PLACE IN N.A. ATV CONTEST WITH 8,362 POINTS

WB4AOH 1984 "GOOD IMAGE", XEIL 1984 "SSTV'ER OF THE YEAR" AWARD WINNERS AT CHICAGO CONFERENCE

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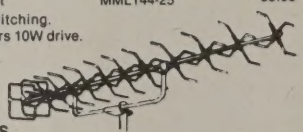

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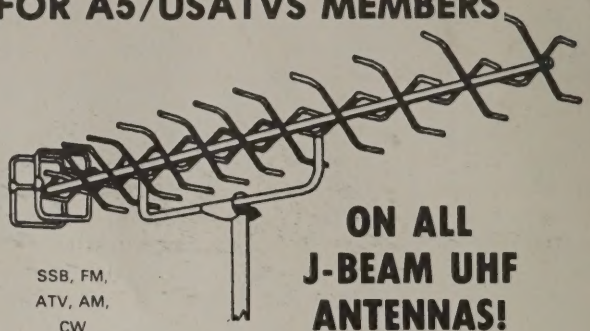

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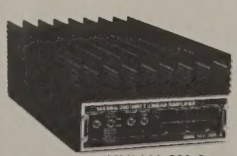

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MML144/100-LS	1 or 3W	100W
MML144/200-S	3, 10 or 25W	200W
MML432/30-L	1 or 3W	30W
MML432/50	10W	50W
MML432/100	10W	100W

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SSTV ON 51-H SPACE SHUTTLE LOOKS GOOD! "A5" SPECIAL REPORT

Both FSTV and SSTV appear to on the agenda on the upcoming April 1985 launch of NASA Mission designate 51-H. In a "telephone interview" with "A5" on October 2nd, Johnson Space Center's Louis W. McFadin (W5DID) in Houston re-confirmed an earlier March 9th public statement of two more planned missions in 1985 carrying onboard Ham Radio equipment. More recent developments have surfaced with NASA requesting JSC to "look into the possiblities of placing an on-board "SSTV" converter on the flight of Astronaut/Amateur Dr. Tony England W0ORE. Dr. England is the second of three Astronaut/Amateur's, the 3rd being recently named Dr. Ron Parise WA4SIR formerly of Greenbelt, Maryland.

The Dream Is Becoming A Reality . . .

"We are currently looking into ways of obtaining SSTV equipment and interfacing into the main TV video system on the Space Shuttle Spacecraft" McFadin commented, "even the possiblity of having a seperate SSTV picture only camera is being considered. Our goal is to be able to send the highest resolution black/white and color SSTV pictures for those who can receive such pictures back on earth and also reward those longtime supporters in SSTV with the regular resolution modes". Such an event for SSTV has long been dreamed about by many video Amateurs. The idea can be traced back as far as December 1982 during telephone conversations between A5's WB0QCD and WESTLINK's WA6ITF and ARRL's Peter O'dell and Bernie Glassmeyer on the possibilities of placing "taped" SSTV pictures onboard the flight of STS9 and Dr. Owen Garriott W5LFL. The idea never had time to get implemented in a very cautious initial STS9 flight, but it's concept began a flurry of thinking for HAM-TV possibilities by the powers to be for future missions.

Hi-Res. Pictures

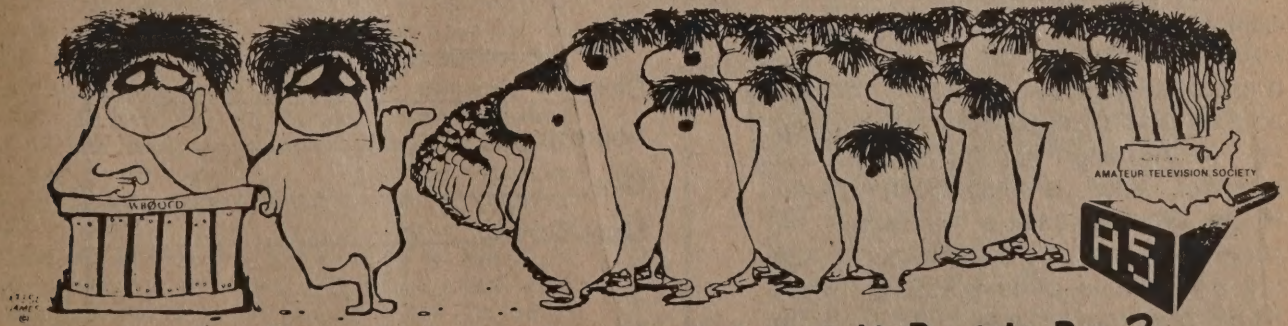
Discussions on obtaining SSTV equipment are currently underway between JSC's Louis McFadin W5DID and commercial SSTV manufacturers. Although at writing, no firm has yet submitted interest in the project to the ARRL, it has been learned that MICROCRAFTS owner George Steber WB9LVI declined participation on such a project at this time, due largely to present workoad requirements. ROBOT RESEARCH CORP. of San Diego, CA. is therefore, the likely candidate

"CQ SSTV DE WØORE CALLING, STANDBY FOR PICTURES!"

for such an undertaking. After an apparent shakeup of personnel at ROBOT immediately after the death of the companies owner, newly elected President John Stahler WB6DCN (former Chief Engineer) has been discussing the 51-H project with McFadin using "automatic sequence SSTV techniques". That is to say, 6-12 second Color pictures followed by 1-72 second HI-RES. color image. 36 and 72 second HI-RES formats are also possible. *IT IS HOPED THAT THE REGULAR RESOLUTION 8 SECOND B/W MODE FORMAT CAN ALSO BE INCLUDED SO TO ALLOW THOUSANDS OF OLDER SSTV CONVERTERS CAN BE UTILIZED FOR SUCH A HISTORIC EVENT. The SSTV Converter used will be interfaced with the Space Shuttle's own onboard Microwave FSTV CCTV video relay system. Output of the SSTV pictures may be viewed directly on Ten Meters. *(See Channel 39 A5/USATVS Letter to ARRL).

FSTV Too!

Members of the Johnson Space Center Amateur Radio Club have also expressed interest in relaying incoming Shuttle video pictures into the local Houston area on Amateur FSTV similar to the hookup last November/December on the STS9 Mission with USATVS Member Bruce Brown WA9GVK in the Washington, D.C. area. The general public could also get involved thru such an ATV link. "We are even thinking of putting in a SSTV telephone line for pictures to and from the JSC Amateur Radio Club setup" McFadin told "A5" in the telephone interview. "A5/USATVS" has already sprung into action by contacting Houston area FSTV/SSTV'ers to lend some assistance and man hours in the Johnson Space Center ARC project. A trip to Houston prior to the flight period is being planned. Needed equipment is being assembled in preparation for the anticipated NASA approval. If you live near the area and think that you might have some time to donate to the preliminary work needed prior to launch, contact "A5" or Dale Martin KG5U, maildrop JL5, c/o Johnson Space Center, Houston, TX. 77058. We shall keep you informed as this unique story develops!



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Channel 2

RESULTS OF AUGUST NORTH AMERICAN FSTV UHF CONTEST

EXTENSION TO "WEEK LONG" TIME PERIOD FAVORED BY MOST

The results of the annual 1984 "A5 ATV MAGAZINE" North American UHF FSTV Contest are in! This year's contest was held during a one week period beginning on Monday August 20th (0001) and ending on Sunday August 26th (2400). The new one week ATV contest period was favored by most who entered the contest. The extended period allowed a more relaxed atmosphere in operating, better chances for picture/audio signal improvements and DX openings. The one week time base will become a fixed period for future "A5" contests. Point accumulations were (as in past years) based on a split RECEIVE/TRANSMIT signal accumulation, type of picture description (sync, locked B/W, Color, etc), PICTURE SIGNAL STRENGTH reading multiplier (P1-P5), DX DISTANCE mileage multiplier and a BAND USED multiplier (400, 1200, 2300 etc.). Printing typeset errors were shown in the August 1984 Vol. 14 #8 on the DX Table multipliers. Correct tables were published in the September Vol. 14 #9 issue. All submitted contestant log entry's showed the correct table figures.

New York ATV'ers Sweep Top Honors!

There were 27 entries in the NA FSTV UHF Contest. Logs came primarily from midwest and eastern states. The state of New York swept most of the top honors. No entry's were received this year from Western states including the heavily ATV populated state of California. FIRST PLACE WINNER went to ATV STATION WA2CXW operated by Roger Garbacz of 240 Westwood Road, Lancaster, NY. 14086! Roger had a total of 8,362 points which far distanced the nearest competitor. He also won the designation of the "best organized logbook". His unique breakdown of contest point accumlation totals will be used in a sample guide in next year's contest. WA2CXW had 21 contacts including several VE3 Canadian DX contacts over 75 miles. His equipment list includes VHF Engineering 1 watt strip, Motorola MHW-710 10 watt brick, PC VM and subcarrier boards, Spectrum In'tl 88 element J-Beam. Both on-carrier and sub-carrier audio was used as was B/W and Color video. Congratulations Roger! He will receive an beautifully engraved wooden gold contest plaque to hang on the ATV shack wall, a frameable GOLD award certificate and a one-year extension on his subscription to "A5 ATV MAGAZINE"! Roger also receives a "free" A5 "HAMFEST" (C) 1984 Game Kit for 1st place in the ARRL District #1. 2nd place went to ATV Station WB2KGM operated by Richard Wood of Tonawanda, NY. (6,660 points), 3rd place went to ATV Station K8HVA operated by Guy Cunningham of Plymouth, NY. (6,215 points) (great proof of contact pictures Guy!), 4th place went to ATV Station W2OSW operated by Casimer Pustelnik of West Seneca, NY. (6,050 points), 5th Place honors went to ole' timer ATV Station W2PBU operated by Ray Lamy of Kenmore, NY. (5,075 points). All stations who entered logs for the contest have already received special participation GOLD certicates.

1984 Top Ten Finishers

1.	WA2CXW	NY	8,362
2.	WB2KGM	NY	6,660
3.	K8HVA	NY	6,215
4.	W2OSW	NY	6,050
5.	W2PBU	NY	5,075
6.	WBOQCD*	IA	3,977
7.	KAOCVT	IA	2,870
8.	W2IRU	NY	1,440
9.	N1QG	VT	725
10.	N1CVA	VT	300

*Not Eligible for Prizes
27 Total Contest Entries

"Comments received"; "The extension to one week on the ATV contest was a great help. Although my log only shows one contact per call, some stations were worked many times resulting in improved "P" signal reports as conditions changed day to day." -WB2KGM "Our Western New York ATV Group is very pleased with all the efforts on the promotion of ATV by A5!" -W2PBU. "Where are all those big Chicago area ATV'ers during the contests?" -KA0BVT

"How come you didn't have those K2RIW's hanging out the hospital windows Dave WB0ZJP?" -WB0QCD.

Meet WA2PZV-TV Kenmore, New York!

(Story by Don Fuller W2WHK) Joe Green WA2P2V has been in Amateur Radio since February 1959 at which time he operated on the 2 and 6 meter bands. He has contacted quite a few stations on 6 meters as well as foreign DX contacts. Most of his early days on 2 meters was on SSB with about 25 states to his credit. In October 1982, after seeing a demonstration of FSTV, he immediately was "bitten by the ATV Bug" and has been a very active member of the local Kenmore, NY. He remembers well his 70 mile, P5 contact with W3POS in Erie, PA. He has worked many western NY and Canadian video buffs using his SILVERNAIL SE1a transceiver, a KLM amplifier and 4 stacked 27 element KLM antennas on a fold-over crank up tower. His best ATV-DX is with VE3FCC in Woodstock, Ontario about 100 miles to the west. Operating frequencies are mainly 439.25 and 434 Mhz. "Having two frequencies is great during busy temperature inversions!", says Joe.

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ATV CONVERTER:

ATV-2-Wired and Tested..... $59.95 each
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ATV-2-PCB Printed Circuit Bd only..... $10.00 each
ATV-2-I Instruction Manual Only..... $5.00 each

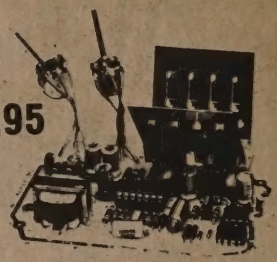
Specifications

RF Input.....420-450 MHz
RF Output.....Channels 2, 3, or 4
DC Input.....+12 Vdc at 50 ma
RF Stages.....2 (MRF-901)
LO.....Varactor Tuned
Fine Tuning Range.....
.....Approx. 30 MHz
Pre IF Stage Gain.6 dB Minimum

Audio Squelch Control

You have a squelch on your 2 meter equipment; why not add a squelch to your ATV monitor. Now you can avoid the major problem of operating ATV—the annoying hiss and static when the signal is not present. With the ATV squelch, you no longer have to turn the volume down when the signal disappears and risk the chance of missing a signal.

The squelch easily connects to the TV receiver audio stage without modification of the TV, since the squelch circuit contains its own audio output stage. You must provide your own speaker. Operator safety is provided by using transformer isolation between the receiver and the squelch circuit, thus eliminating the shock hazard when using a "hot chassis" type TV receiver.



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Now you can get on the air with a high power 100 watt class B linear amplifier for SSB-FM or ATV on the 420 to 450 MHz band and still not spend a lot. This kit is described in Motorola engineering bulletin EB-67 and is available in a number of configurations. For full output, a minimum of 16 watts is required for excitation with an input SWR of not higher than 2:1. Output will maintain stability with a 3:1 collector mismatch at all phase angles. A designed-in low-pass filter suppresses the 2nd harmonic to at least 63 dB down. An external power supply capable of providing 28 VDC, regulated, at 10 amps is also required.

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KEB-67-PK Kit includes detailed step-by-step instructions, printed circuit board, and all electronic components as shown.
KEB-67-PCB Printed circuit board only **$14.00**
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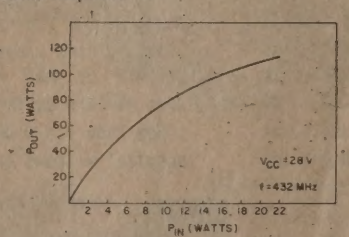

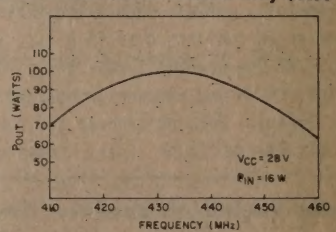

P.C. Boards

The FCC does not allow us to sell Broadband RF amplifier kits in the HF range, therefore we can only offer the printed circuit board and parts on a piece-by-piece basis.

140 watt power amplifier as described in Motorola engineering bulletin EB-63. **EB-63-PCB**

100-180 watt power amplifier as described in Motorola application note, AN-762. **AN-762 PCB**

300 watt power amplifier as described in Motorola engineering bulletin EB-27A. **EB-27A PCB**

Transformers, transistors and other parts are also available.

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In addition to our kits, we also stock parts for other Motorola application notes and engineering bulletins. We have an in-depth stock of Motorola VHF and UHF transistors, Underwood metal clad mica capacitors (Unelco), Kemet chip capacitors, Cambion RF chokes and Ferroxcube Ferrite beads and RF chokes plus other difficult to find parts. If you are having trouble finding a part, call us, we probably have it in stock.

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All letters addressed to this column are kept on file by the Publisher for a period of one year and are available for public inspection by the general membership. Some letters are edited versions for shorter content.

Old Timer Too!

In the December 1982 issue of A5 "Letters to the Editor", Sam Laine W4MDP refers to firsts in Amateur Television in regards to the 1939-40 Worlds Fair in New York. I too, an one of the firsts in the Pittsburgh, PA. area. I built two cameras using a 1847 iconoscope, to which San refers. In fact I still have them, with the technical data sheets. The first unit was built from a design by J.B. Sherman described in the May-June 1940 issues of QST. The second unit was one designed by James Lamb W1AL in the October 1940 issue of QST. There were both 120 line resolution pictures. After much juggling and debugging in the Video Amps they both provided good pictures. Since Sam Lane made reference to documentation in QST, I am attaching a list of articles or bibliographs of Amateur TV articles for your file. I have this bibliograph but not the QST's which were inadvertently lost. If some one is interested in completing a Amateur "non-appliance" type of TV here is a good start. Here is a bibliography of Articles on Amateur TV prior to WWII; Dec. 37, Jan. 38, Feb. 38, Mar. 38, April 38, May 38, Oct. 38, Dec. 38, Jan. 39, Feb. 39, Mar. 39, Feb. 40, Mar. 40, July 40, and Oct. 40. Tod Drogoski 587 Coal Valley Rd. Clairton, PA. 15025

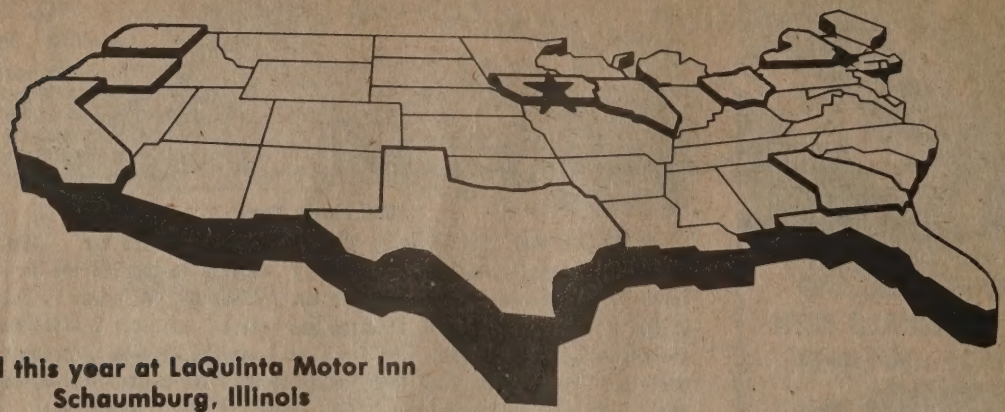
Disappointed TE Systems Owner . . .

Editor A5; After reading your article on the TE Systems Amplifier in the Dec. issue of A5, I decided to buy one. I ordered the amp the first week of January. I went away for two months and expected to have it upon my return, but this was not to be. I called the company and they gave me the excuse that they had received some unpainted cases. I waited for another month and still no amplifier. Another phone call was met with more production delays of some sort. Finally on the 23rd of May, I received the amplifier, but no manual. Well, the amp did not perform to the advertised 100 watts output. Now I'm really upset. First, I experienced a 4 watt insertion loss. The most I could ever realize on output with the amp on was 70 watts. More calls to the company proved useless. It really costs a lot to call the States from Germany. They finally told me to send the unit back for a checkout. After waiting another month, it cane back. Well the insertion loss was only 2 watts this time, but the output was still only 80 watts. By now its August 84 and I still don't have a manual!!! Today I called about a manual and got the runaround again. I would like to know if any other readers have experienced difficulty with TE Systems. Needless to say, I am very unhappy with them. Since you had no trouble with the amp you tested, perhaps you may know something I'm missing. Thanks for listening. I know you are interested in seeing that your customers get the best service possible from advertisements in your magazine. 73's Bob Crockett DA1AF

SSTV Apology

Editor A5; See attached letter of apology to N6JQM. I would appreciate it if you would publish the letter in it's entirety or the below apology or both in one of your issues of A5 magazine. "To the Amateur who's call sign sounds like N6JQM or N6JQF and is called JT. I would like to apologize for the uncouth treatment you received from KC0CF and WD0ADZ on 9-11-84 at approx. 9:00 AM PDST on 14.230Mhz. The incident has been reported to the FCC for action. They said W4CVS was Broadcasting SSTV. Lie #1 (Broadcasting on the Amateur frequencies is illegal). They said you were interfering. Lie #2 (there is no way they could have known if you were interfering with the 2 stations operating up and down the east-coast because they are in Iowa. I once knew a CB operator that had a long Mic-Cord so he could make it into the bathroom and his wife fed him his meals in the CB shack. This way he was always ready to give someone Hell if they got on HIS FREQUENCY. These two dead-beats remind me so much of that CB'er." Thanks, 73's N7QM Wayne Girton

A5/USATVS FALL NATIONAL ATV CHICAGO CONFERENCE COMPLETED



Held this year at LaQuinta Motor Inn
Schaumburg, Illinois
September 20-21

Awards Presented

The 1984 A5/USATVS National UHF ATV Conference is now history. It was held this year on Sept. 20-21 in conjunction with RADIO EXPO in the Chicago area. The official ATV Conference Hotel meeting location headquarters was at the La Quinta Motor Inn (Suite #301) on Higgins Road in Schaumburg, Illinois. Guests began arriving on Thursday evening with a short program given on Friday evening. Many ATV'ers attended the RADIO EXPO hamfest north of the ATV Conference site. FSTV and SSTV'ers from Michigan, Indiana, Ohio, Wisconsin, Iowa, Kentucky and Illinois enjoyed the two-day RADIO-EXPO affair.

RADIO EXPO is one of the largest and oldest HAMFESTS in the midwest held each September. It is our opinion, however, that the 84 gathering was also one of the worst organized events ever witnessed. Cooperation among the HAMFEST Committee members themselves left alot to be desired. It seems that those who were originally assigned the operating duties abandoned their assignments in the last few weeks. Nobody seemed to know where anything was nor where there own dealers were set up in the exhibition buildings. Booths were unmarked which made it very difficult for the consumer to find a particular company. The flea market was at its usual level of excellence. Spread out over a county fairgrounds setting, Saturday seemed to be the best day as misty-rainy weather settled in on Sunday.

Attendance at the A5/USATVS ATV Conference was disappointing. Over 200 flyers were mailed (along with the usual advertising campaign) to ATV'ers in Illinois, Iowa and Wisconsin. Past ATV Conferences usually produced 60-100 attendees. Those that did attend, witnessed modified informal program presentations. SSTV was the main theme on Friday afternoon and evening with TRS80C and Apple SSTV deonstrated. Motion SSTV experiments in 1982 by Tom Hibben KB9MC were presented on videotape. Also on display was the new WRAASE SC-1 SSTV/FAX converter and MITSUBISHI P50U Video Printer. Two VCR recorders ran continuously with ATV type programs and FSTV demonstrations from around the midwest. John Beanland G3BVU/W1 of Spectrum International (Mass.) was the main guest speaker on Saturday night and explained some pretty sophisticated antenna theory. Clyde Miller WB4AOH of Owensboro, KY. demonstrated the new PHOTOVIEWER "Commsoft" Apple SSTV System. Highlights of the ATV Conference included official 1984 award presentations to Luis Chartarifsky XE1L (formerly XE1LCH) of Mexico for "A5 SSTV'er of the Year" and Clyde Miller WB4AOH of Kentucky for the prestigious "A5" FSTV "GOOD IMAGE" Award. XE1L of Mexico ordered two PC Electronics TC-1 ATV Transceivers at $750 and two 88 element J-Beams from Spectrum International. He will attempt to be the first FSTV station "on-the-air" in Mexico as soon as he finds a lucky friend to get on with him. SILVERNAIL ELECTRONICS products by WYMAN RESEARCH of Indiana was also represented. Several conference attendees wondered why W6ORG never seems to attend the annual ATV Conferences. Those presumed "missing in action" were Henry Ruh KB9FO and Mike Freitag N9CRN.

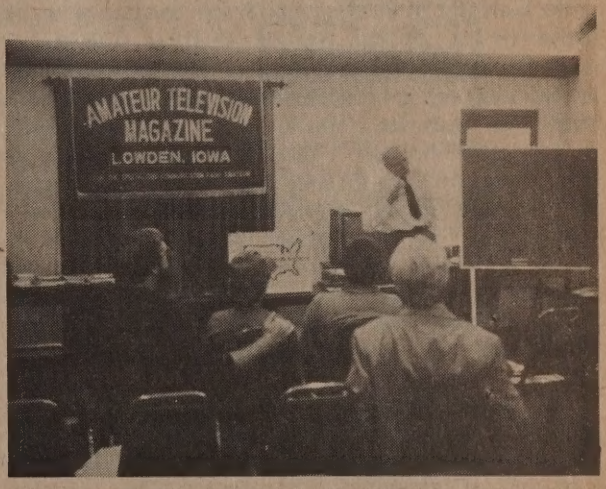
Wether or not the "A5 ATV MAGAZINE" annual UHF ATV Conferences will continue in 1985 is subject to area support and attendee interest. Cost expenses in hosting such affairs is quite high. The conference in Peoria in 1982 (although fairly well attended) came up over $500 in the red. The 1983 Conference at York, PA. broke even with help from the local ATV Club in Harrisburg. This years expenses set the Chicago ATV Conference once again in the red by about $350. As conference attendees departed for home on Sunday afternoon (as usual) a good time was had by all (or as WB4AOH kept putting it; "fantastic")!

Next Official A5/USATVS ATV Meetings to be held at LaQuinta Motor Inn North, Dayton, Ohio on Saturday night in cooperation with the 1985 April Dayton Hamvention.

Daughter of WB9CKS (Marilyn) at Conference Registration Table

Spectrum/A5 store booth at Expo

WB4AOH demonstrates Apple-SSTV



G3BVU/W1 lectures on Antenna Theory

QCD hired a "clown" to promote HAMFEST Games

WBOQCD congratulates 84 Conference Award winners XEIL & WB4AOH

GO ATV "WIRELESS!"

With Radio Shack's New 49 Mhz. FM XMTR/RCVR Handsfree Operation Means Flexibility

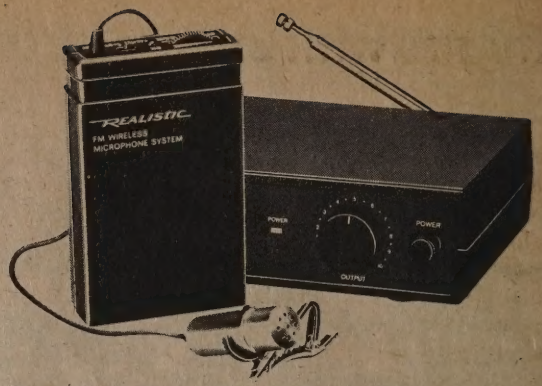
by Mike Stone WBØQCD

Radio Shack Company (A Division of Tandy Corp.), has been beefing up their line of "video" accessory items lately with new video in/out Color TV's, Color Enhancers and Processors, Video Switchers, Variable Cable-TV Tuners, as well as a whole line of various VCR gadgets. We have reported in the past on some of their catalog items that enhance ATV mode operations such as the TRS80C Color Computer, The MITSUMI UES-A56F Varactor UHF-TV Tuner, and the Realistic Hi-Ball 600 Ohm Dynamic Michrophone. We have found yet another of their items that can make FSTV operation more enjoyable than it already is. Announcing (fanfare please-thank you); The Realistic Cat. No. 32-1220A FM Wireless Michrophone System.

The Realistic FM Wireless Mike System consists of an FM Transmitter on 49 Mhz. (either 49.83 or 49.89 Mhz. is available) and a dual conversion Receiver. The transmitter incorporates a clip-on condenser michrophone which permits "hands-free" operation. This is especially useful on ATV as it can allow the HAM-TV operator to move around "in the shack" (and quite some distance from it) without dropping out of audio sub-carrier voice range which happens quite often with a "fixed" michrophone. Imagine, being able to "talk" to your fellow ATV contact while behind the camera and "panning the shack" explaining what all the pieces of gear are about! The "wireless" system also allows remote control camera operation with near transmitter audio.

The Transmitter employs very sensative staging for excellent audio fidelity reproduction, is crystal controlled for better stability and enploys 5 transistors, 2 diodes and 1 LED. Frequency tolerance is rated at 0.002%, RF output on 49 Mhz. at 10,000uV/m, spurious and harmonic supression down -26db against the fundamental output, requires 2-3VDC (using two AA type penlight cells which last about 20 hours. The operating range tested here at "A5" (over open ground field area) is between 125-150 feet-certainly sufficient for any size ATV shack!

The Receiver is a dual conversion type, including an I.F. 10.7 Mhz. and a 455 Khz. Ceranic Filter to allow both high sensitivity and selectivity so that adjacent channel or strong signal interference is reduce or eliminated. We saw no interference to this system when operating an VHF/HF frequencies on CW, SSB or SSTV. It employs 10 transistors (one looks like a FET), 1 intergrated circuit IC, 9 diodes, 2 LEDS and 1 zener diode. Unlike the transmitter which requires battery operation power, the Receiver has its own built in 110VAC power supply and connecting cord. Sensitivity is better than 5uV for 20 db quieting, selectivity is greater than 60 db +/- 15 khz. Spur and Image rejection both are rated at greater than 60 db. There is an onboard squelch control adjustable from 5 microvolts and up.

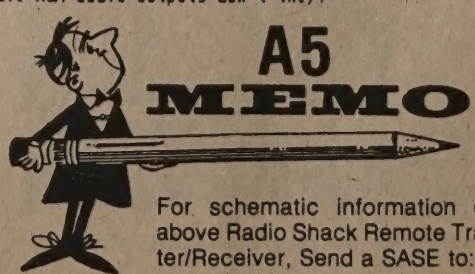


FM Wireless Mich. System #32-1220A

Two line "outputs" exist on the rear panel of the Receiver. These are the hookup points that go to your FSTV exciter's FM audio-subcarrier input circuitry. The "mike" line output is a standard 1/4" phone jack (0-10mV. across 1k ohm). The "line" output is a RCA type jack (0-500mV across 10k ohm). For my own P.C. Electronics "homebrew" TC-1 transceiver, the "line" output seemed to work the best with a test station 25 miles away. I use this "wireless" system fed into my MFJ-1440 Video Enhancer/Switcher on Channel 4 which keeps me from having to keep track of yet another audio input line to my FSTV rig. One nice unanticipated surprise came as my MAXXON 49S "Wireless" Headsets also had the same frequency as my "Radio Shack" unit which gave me greater range flexibility and a 2nd and 3rd remote inputs should I have "guests" in the HAM-TV shack? (Merv Griffin, Johnny Carson, eat your heart out!).

The transmitter pocket-clip device has an adjustable mic-gain control and on/off switch. The mike-clip, placed as close to the mouth area (under the neck) as possible is best. The "line" and "mike" output jacks are suppose to be used for connection to a PA amplifier or tape recorder (Ah-ha! Video tape recorders as well... dubs and program narrations, hmmm). Gee, I wonder about hooking it to my ICOM 2 Meter or 430-440 Rig using VOX? The Radio Shack Sale Price of $49.95 just might prove out to make a more enjoyable ATV winter? In closing, it is always fun to bewilder the Radio Shack employees as they try to guess what I am up to with each new visit to their stores. They usually know, that whatever it is, it isn't an application that it is suppose to be designed for! 73's -WB8QCD

A5 Hint; there are a number of very cheap FM wireless "mikes" that feed into FM radios. Most stereo receivers have RCA audio outputs don't they?



For schematic information on the above Radio Shack Remote Transmitter/Receiver, Send a SASE to:
"A5 Membership Services"
P.O. Box H, Lowden, IA 52255

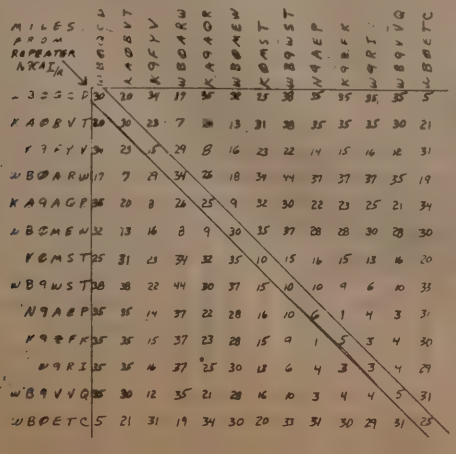
ATV TIPS WITH UNCLE DON . . .

FSTV Distance Table Chart

How many times have you heard members of your local ATV group question how far they are from each other or how far they are from the repeater? Don Hartman KA0BVT of Moscow, Iowa (near Davenport), sent us his homebrew method of helping to solve this administrative problem. He sat down a couple evenings and took all of the active callsigns of the local ATV gang (within 50 miles) and figured up individual distances from each other. There are duplicate sets of call letters going down the sides of the numerical distance chart. Finding your own callsign and that of the ATV station you are in question about-you simply cross reference them to the point where they meet at the correct numerical distance indicator. Located in the upper corner of the chart, is the computed mileage from the N9CAI Remote Transmitter & Repeater located in Davenport, Iowa. It is highlighted in a boardered diagonal outline. This DX Distance Chart when used in conjunction with a local geographical placement map, just about answers all questions on "who is where and how far"?

Wait, there's more ...

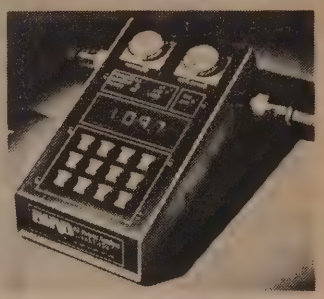
Another related "ATV location" tip, is to take a piece of masking or first aid adhesive tape or paper (large type envelope seal flaps work well) and cut a top half circle shape pattern (for CDE44/HAMII Rotor boxes) and place above the rotor's degree indicator markings. Then, draw lines above the appropriate degree where each ATV station is located (use UHF video fixes-not 2 Meters). This simple reference point elimnates the usual 10-15 minutes of "you swing your beam and I'll swing mine" syndrome. Having a seperate UHF 430-440 Mhz. rig (or switchable on the ATV antenna system) is great for going on SSB (for shrill carrier tone) or FM (for most quieting effect) and retransmitting the UHF ATV signal (video or audio) on the local 2 Meter channel so the sending station can correctly align his array on your location. If you have one of the SCIENCE WORKSHOP "on-carrier" magic boxes that interfaces with the ATV downconverter at the TV set and allows the user to "hear" video carriers and "on-carrier sound" audio out of a seperate speaker, one can attempt the same process. (For more information on this device, write to Science Workshop directly; Box 393, Bethpage, NY. 11714 - See "A5" September 82 Vol. 12 #9, page 5 or send an SASE to "A5" Membership Services mentioning this article).



FSTV Coming Attractions in our December 84 Issue!

- 1984 Year End "A5" Article Index
- "Creative ATV" Photography Style! K6GLG
- TX/RX Line Relay Switching for Antennas & Preamps
- 8"x11" USATVS Membership Certificate!

The Best Got Better



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BUILD A PROFESSIONAL LOOKING, CALL/ID "ON-THE-AIR" LIGHT-SIGN FOR YOUR ATV SHACK!

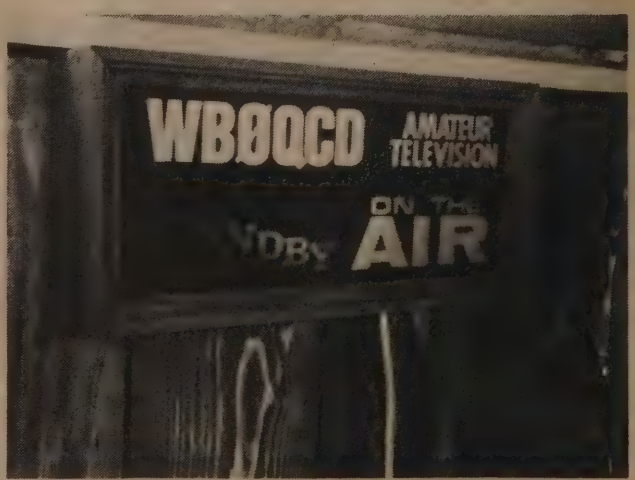
Faceplate uses printer's negative and colored pieces of plastic for an attractive look.....

Bored waiting for that UHF-TV band to open? Want to add a little "class" in the ATV Shack? Well "A5" fans, get out a small hammer, a screwdriver, some electricians tape, (don't forget the Elmers Carpenters Glue) and a piece of pinewood board (or whatever) and get ready-we're going to "build" a fancy electrical AMATEUR RADIO CALLSIGN IDENTIFIER and STANDBY/ON-THE-AIR LIGHT SIGN!

The original concept credit goes to Fred Hurteau WD4SKH of R&H Distributing, Rt.5 Southwood Subdivision, Whiteville, N.C. 28472. Fred has been making these neat little gadgets for many years, ($29.95 plus $2.50 shipping) but business demand slowed down enough for Fred to all but give up the unique construction on the Retail level at local Southern hamfest circuits. The pinewood box construction size details are; 12" in width across by 4" deep by 6" high. The thickness of the wood is 3/4". Pine works well for ease of construction and staining flexibility. A routed picture frame type faceplate can be used to hold on the signface material (check your hardware and craft stores-they have some premade material). The electronic components consist of a small size 7.5 watt nightlight bulb, a socket to put it in, sometype of mounting apparatus and necessary wire cord and 110vac plug (dark brown works best against paneling). More than one bulb may be used if seperated compartments are constructed for each color and logo. WD4SKH even had an optional 6-12vdc/120ac relay (100 ma.) that worked with what he called an "RFS-1" kit that sensed your rigs RF output and turned on the sign automatically. (It could also be wired to an external in-rig on/off relay). Fred sold these units for $9.95.

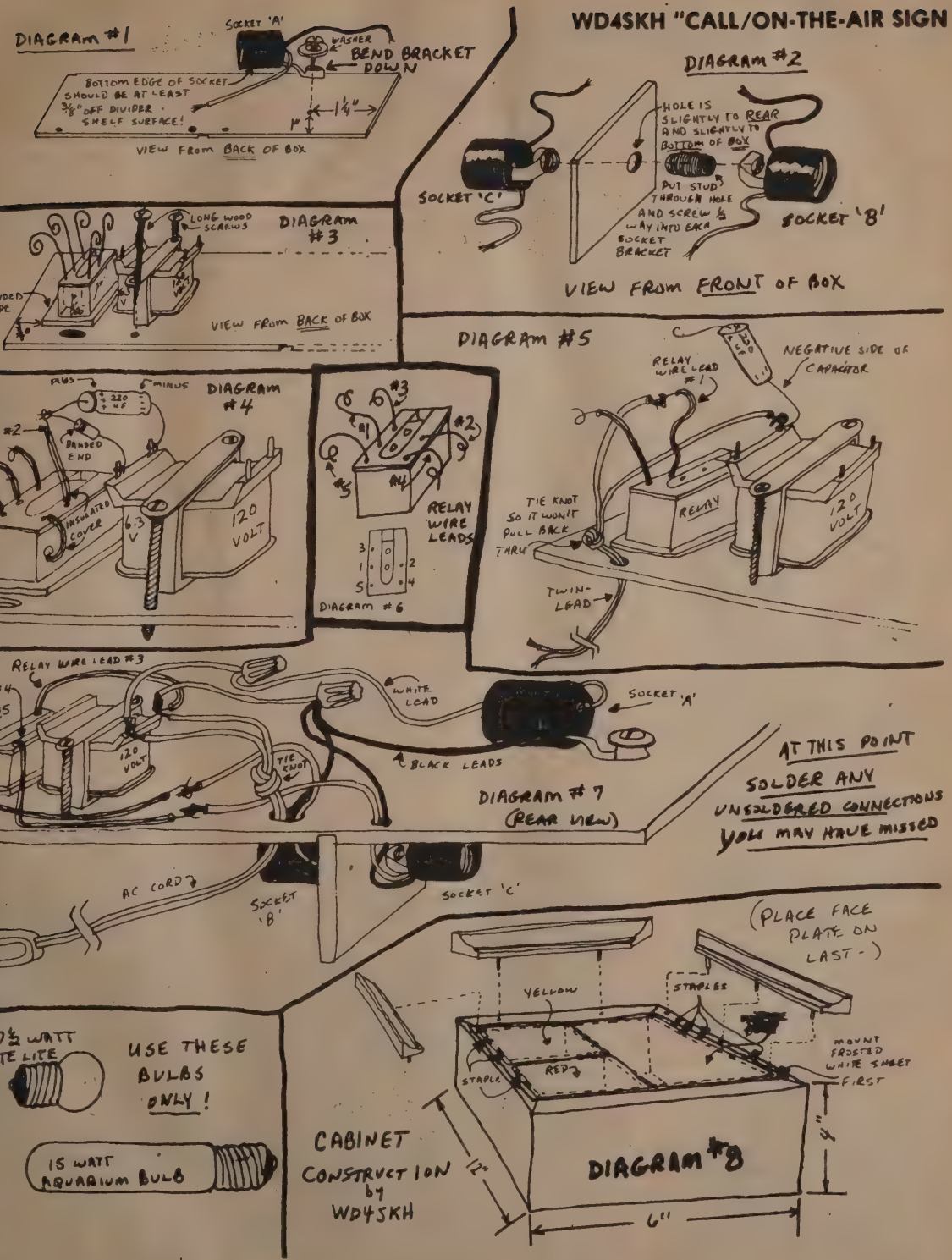
The Callsign Kit project uses a printer's black "negative" for the main facesign. To do this, make up your own design with black letters or symbols pasted on a white piece of paper (just like you make FSTV CQ signs). Take it down to a printer (quick-print places might be able to help although they usually farm out that type of work) and ask them to make a regular negative copy of your artwork. It must be a big enough sheet to custom fit within the picture frame type molding. If you have trouble locating such a printer-you might write to Fred (include $8.00) for one or as a last resort, send your artwork to our "A5 Membership Services Department and we will get it done for you. Fred has "ready to go" signplates such as the one pictured in the graphic drawing. I custom made mine to relate to ATV. My call "WB8QCD" is white, "Amateur Television" is yellow, "Standby" is green and "On-The-Air" is of course red, what else? How did I get the colors, you say? Get some colored transparent pieces of plastic film and make them fit just behind the black negative but on top of the needed white background sheet. Gee, how about flashing segments?

Why not get your other ATV buddies together at that next Club Meeting and have different members get the various parts while one of the carpenters in the groups grooves out the boards? While one does the wiring, another the pictures, another the sawing and yet another to staining-before you know it, the group will all have professional looking, colored "ON-THE-AIR" lights. Who said this was "Amateur Television"? -QCD



"The Finished Work of Art for Under $15"
"For additional information on this project, send SASE to A5 Membership Services Dept. (%WD4SKH Project)

WD4SKH "CALL/ON-THE-AIR SIGN



KENTUCKY "ATV'ERS HOMEBREW THEIR OWN FAST SCAN TELEVISION TRANSCEIVERS!

Radio Shack's - Mitsumi UES-A56F UHF-TV Converters Used

Clyde Miller WB4AOH Announced As 1984 "A5" Good Image Award Winner!

WB4AOH writes...

After reading the original article by WB8QCD and discussing it with Dave, W4LUB, another Owensboro resident, we decided we had to get on ATV. We were already active on SSTV, but the possiblitities on using live TV in the community excited us.

Before this time some very limited experimenting was being done in Owensboro by KA4LIM, N4EAE, and KC4VL, who lived within a few blocks of each other. They were using 300mw homebrew transmitters and old tube type, retuned UHF TV downconverters. Their antennas consisted of used TV corner reflectors and 300 ohm twinlead feedline. They, of course, had a very limited range (a few blocks), but the discussions they had on the local repeater concerning construction and tuning and what they were seeing began to interest us even more. We couldn't stand missing out on this interesting new mode and soon invested in Silvernail equipment. After we got on the air with high gain antennas and our 10 watt rigs we were able to join in with the original three. David and I were putting P5 signals to them but we were only seeing them about P3. We kept teasing them about their poor signals and junkbox transmitters. Finally they upgraded to some Silvernail 1 1/2 watt GLB-T458L transmitters and new homebrew antennas. Between us there were a quagis, yagis, double skeleton slot and even a J beam antenna in use. Now with five on the air with P4 to P5 signals the fun really began.

We started doing everything we could with video; computer games, home movies, homemade slides, VCR tapes and helping each other trouble shoot equipment with the aid of video to show what we were doing. Mostly I think we enjoyed telling each other how ugly the other guy looked on our TV.

Of course, we never missed a chance to show off our ATV stations to anyone we could get in the shack. It's hilarious to see the reactions of people when you put them on camera the first time. Sometimes they almost hurt themselves jumping out of the view of the camera. It's much worse than anything you have ever seen in mic fright. In order to get the other Hams interested in the mode we had become enthusiastic about we took our equipment to hamfests and club meetings in the area to demonstrate ATV. We discovered that most hams thought FSTV was like SSTV and lots of them would remark "I didn't know that's what FSTV was about".

Several of us had only handheld two meter rigs to use as an audio link. This turned out to be a blessing in disguise. For everyone to be heard we had to use the local repeater, which was not used all that much in the first place. As the original five would carry on their ATV activities on the repeater those monitoring became interested in what was going on.

Art, W4TOY, who was one of the newly interested, was trying to think of a cheap way to monitor our video when he discovered that the Radio Shack UHF varactor tuner (cat.no. 277-220), which only cost $24.95, made an exceptionally hot ATV downconverter. We published a short article about it in the Owensboro Amateur Radio Club newsletter and shortly after we had NW4A, N4AJG, KA4BCM, WB4BSL, WD4IMK, KA4YBL, KA4NIP, N4FVF, WB4NTT and several other hams even in neighboring towns, watching our activities. The best DX so far has been about 70 miles with KB9DJ in Grayville, ILL.

1984 "A5" Good-Image Award Winner

Amateur Television Station

WB4AOH - TV

Dr. Clyde Miller
3701 Frederica Street
Owensboro, KY 42301

Clyde is active in ATV, SSTV, RTTY, OSCAR, TVRO and Computers. He is the main force drive pushing HAM-TV in NW Kentucky. His Commsoft Apple IIe system is heard often on 14.230 Mhz. SSTV. Clyde enjoys traveling, TVRO'ing and continuing his profession as a Chiropractor.

Congratulations Clyde!

Channel 12

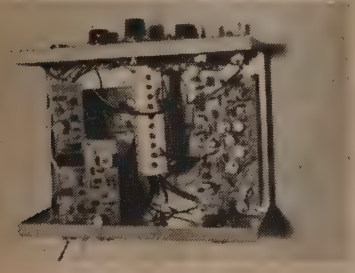
W4TOY, no longer content to simply monitor our video, assembled his Radio Shack downconverter, GLB-T450 transmitter and Silvernail AL-1 amplifier into a very professional looking transceiver and then added a color camera to become the first in the area to be on ATV with color. He even added a red rose to his rainbow test pattern and the words "a touch of class".

Not to be out done, N4AJG decided to build his ATV transceiver as a mobile unit. He became the first color mobile in the area, providing all of us with an excellent view of his VW's travels around town. Not long after that there were a number of very professional looking homebrew transceivers on the air AND COSTING JUST OVER $100 DOLLARS!!! (not considering the cost of the camera).

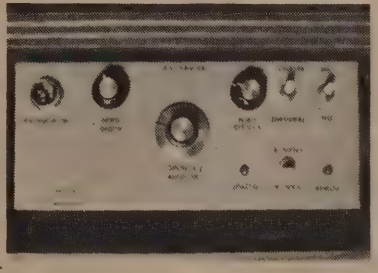
With all this ATV activity a major drawback became evident; if several stations were in a round table discussion at the same time not everyone could see each other, being limited by the narrow beamwidth of our directional antennas. We were also wearing out our antenna rotators twisting our antennas back and forth. The solution; an ATV repeater! With the expertise of Larry, KC4VL, we built a repeater. It was put together with a combination of Silvernail modules and homebrew circuits. The repeater site chosen was the highest building in Owensboro (20 stories) giving us P5 coverage all over town. We have just finished installing a remote controlled camera with a powerful zoom lens and all weather cover on top of this building so that all ATV's can watch the horizons during storm alerts. Remote control is by microwave link provided by a local industrial manufacturer in recognition of our club's extensive activities in weather spotting and emergency communications assistance. Incidentally, our ATV repeater is the first in the State of Kentucky, one of many "first" our club has been responsible for.

The club provides activities "that are too numerous to get into" but throughout the year we can say that ATV has certainly been a very big interest lately to its members.

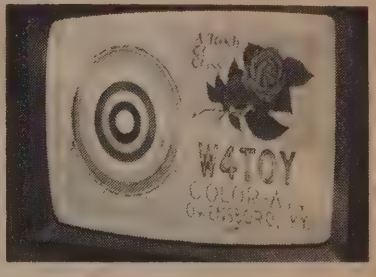
Many in our local group have computers that they are using on ATV. In addition to using them to play the usual games, they are feeding RTTY and MSO signals simultaneously to the ATV repeater so others can watch their QSO's. This is just one more of many exciting ways ATV can be used. I am sure we will discover more applications as we continue to operate and develop. Those who haven't experienced ATV don't know what they are missing. ...ONCE YOU TRY IT, YOU'RE HOOKED!!!... 73's WB4AOH



KC4VL's Homebrew Transceiver



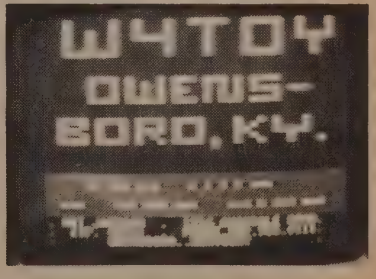
Front View



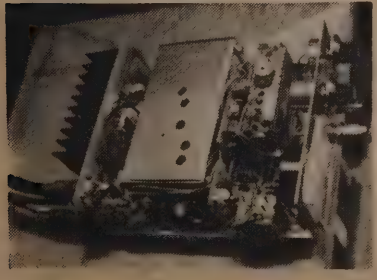
W4TOY Color Test Pattern

N4FEF's FSTV Design

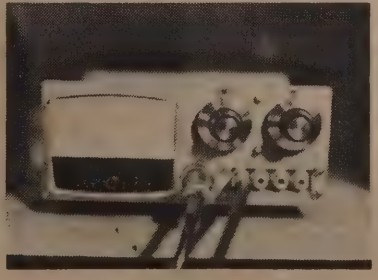
Front View



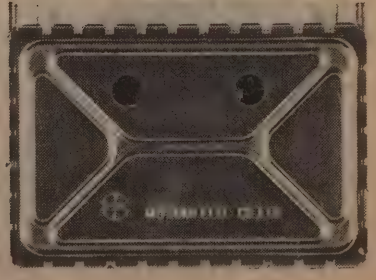
W4TOY Computer ID



W4TOY's Entry



Front View



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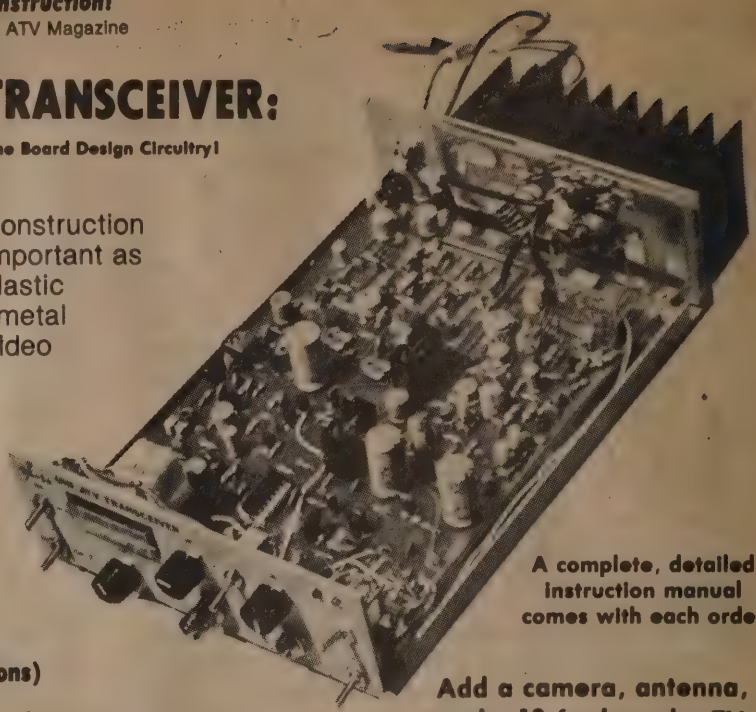

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ATV KITS AND MODULES

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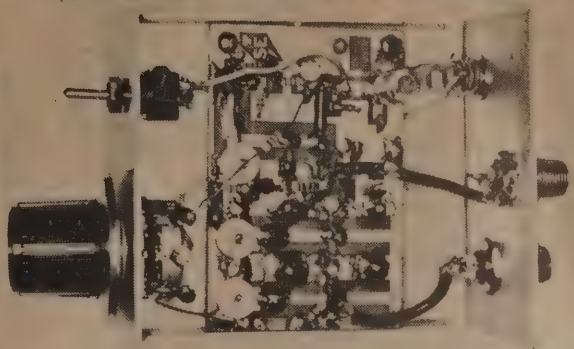

DC–1

LA-1

A-2

"Build It Yourself and Save!"

P-1

VM-2

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Add 3% — Minimum $2.00

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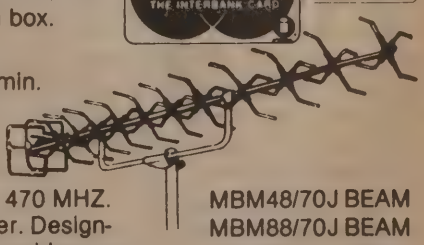
VM-2 VIDEO MODULATOR — Wideband collector video modulator for solid state exciters such as those from GLB and Hamtronics. Input for 4.5 MHZ audio sub-carrier. 2½" x 1½"; **$15.50** kit, **$19.95** assembled.

A-2 4.5 MHZ AUDO SUB-CARRIER — Accepts audio from VCR or GLB audio processor to provide ATV audio on TV set. Has on-board voltage regulator and shielded inductor. 2¾" x 1"; **$19.95** kit, **$25.95** assembled.

SA-1 VIDEO SYNC AMP — Provides separate video sync gain control for VM-2 above or SE - 1a transceiver. Useful when driving solid state amps. 1¾" x 1¼"; **$15.95** assembled, **$12.95** kit.

DC-1 UHF CONVERTOR — Varactor tuned with 2 RF stages. BFQ-74 input standard. Double sided stripline design. Outputs to TV ch. 2, 3, or 4. Can be tower mounted. 11 — 14 vdc. 2" x 3"; **$39.95** kit, **$54.95** assembled, **$89.95** complete in box. **Box kit $30, includes all hardware for the DC-1.**

P-1 WIDEBAND LOW NOISE UHF PREAMP -- Uses BFQ-74 transistor for min. 18 db gain and 0.6 db noise figure. Covers 420—450 MHZ band. Other frequencies received with change in input inductor. 2¼" x 1 3/8"; **$22.95** kit, **$31.95** assembled.



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MBM88/70J BEAM
15.7dBd **$59.95**
18.5 dBd **$89.95**

LA-1 UHF AMPLIFIER — Uses 15 watt MRF641 transistor with 7.8 db gain @ 470 MHZ. Stripline inductors with on-board pin diode antenna switching for a receiver. Designed for wideband color video with exciters such as the GLB T450L that provides up to 3 watts drive. Drilled and tapped heatsink included (4½" x 1¾"). 1 to 3 watts drive typically gives 6 to 18 watts output. 12 — 14 vdc operation @ 4 amps max. Double-sided board is 4½" x 2". **$79.95** assembled with test data.

LA-45 UHF AMPLIFIER — Uses MRF 646. Input power of 6-15 watts typ. gives 20-50 watts output. Biased for linear operation. Kit includes all parts, instructions and 4.2"x 3" double-sided stripline board. Needs 12-14 vdc @ 9 amps max. **$64.95** kit, assembled **$80.** 4"x 5.5"x 1.75" heatsink **$15.00.**

GLB T450L TRANSMITTER — 4½"x 2" RF board typically supplies 2—3 watts FM output, 1—1½ watts average video RF output. Changes for wideband video modulation provided. Comes with crystal for 439.25 MHX audio kit above. Also included separate 1"x 4" audio processor board which supplies audi for FM modulation for the A—2 4.5 MHZ audio kit above. 12—14 vdc @ 2 amps max. **$69.95** kit, **$89.95** assembled and tuned. *Kit now with pre-wound coils*

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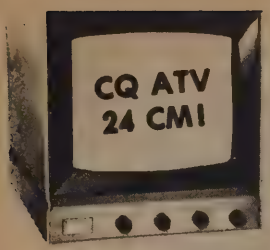

COMPARING 70 CM and 24 CM ATV

by Allan Latham GBCMQ

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CQ-TV Magazine

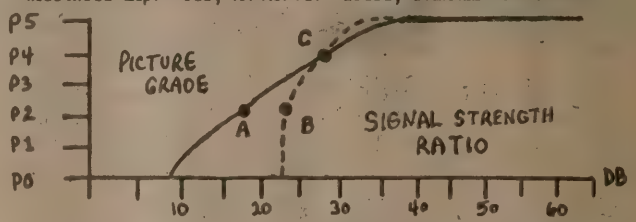
EDITOR'S COMMENTS: Our USATVS International Exchange Program has really paid off with the exchange of books, journals and technical papers with other ATV Organizations thru out the world. Our "exchanges" with the BRITISH AMATEUR TV CLUB (BATC) has been very helpful in 1984. We present here, for A5/USATVS Members, an article by Allan Latham G8CMQ that was published in the August 84 #127 issue of CQ-TV Magazine. (I might add that this issue was a whopping 72 pages thick-which is the largest issue they ever turned out. For more information on CQ-TV Magazine, the BATC Journal, write to; D. Lawton, Grenehurst, Pinewood Road, High Wycombe, England HP124DD). Many U.S. ATV'ers, having conquered 70CM ATV operations are curious about even higher Amateur Video frequencies. Latest in 900, 1240 and 2300 Mhz. ATV is gaining popularity. Interest is even surfacing about FM-ATV. G8CMQ gives many of us a quick glance into the future with his experience on 70 CM and 24 CM TV applications. It is interesting "Food for Thought" for the A5/USATVS enthusiast- WB8QCD.

A Look in to the Future . . . G8CMQ

Many of you with considerable experience of 70cm AM TV will now be thinking about 24cm MD (Medium Definition)-FMTV. Before taking the plunge you probably like to have a good idea what you will achieve compared to 70. I have detailed here my own experiences and observations and hope that others will also make known their own results. Such information, especially at this relatively early period in the use of 24 for ATV, will be particularly useful in building up a total picture of the band, this will assist everyone concerned in the future. Under normal tropospheric conditions the path loss will be worse on 24 than on 70 to an extent which depends on terrain and local obstructions (trees, houses, etc). The predictions shown below are for average paths. Experience indicates that for very good -line of sight- paths, 24 will fare better than predicted but, over very bad paths it will be worse.

Take a look at the graph. The solid line is my estimate of picture grade-vs-signal strength for AMtransmissions on 70. The dotted line is my estimate for medium deviation FM transmission on 24. To interpret this look at point 'A'. If you are receiving a P2 picture from a station on 70 then you need to find a 13db improvement (eg: more transmitter power, bigger aerials, less feeder loss etc) to bring this up to P4 (point 'C'). Now look at point 'B', to receive this station on 24 at P2 you will need to find an overall 8db more than on 70.This is likely to be done by increasing aerial gain. However you will see that a further increase of only 5db will raise the signal to P4.

Let's see what this means in practice. 70cm SITUATION: Transmit power..10W psp= 10dBW; TX Aerial..M8M48= 14dBd; TX Feeder= -2dB; RX Noise Figure= -2dB; RX Feeder= -2dB; RX Aerial= 14dBd; OVERALL TOTAL- 32dB. Assume that this is the situation under which you get a P2 picture (Point 'A'). To get the same grade on 24 you will need +8dB more than this. To get a P4 on 24 or 70 you will need +13dB. 24cm SITUATION (to get P2): TX Power..8W FM= 9dBW; TX Aerial..Q.Loop Yagi= 20dBd; TX Feeder= -3dB; RX Noise Figure= -3dB; RX Feeder= -3dB; RX Aerial= 20dBd; OVERALL TOTAL= 40dB. This setup is no more difficult to achieve than that for 70cm. 70cm SITUATION (to get P4): TX Power..50W psp= 17dBW; TX Aerial..M8M88= 16dBd; TX Feeder= -2dB; RX Noise Figure= -2dB; RX Feeder (masthead amp)= 0dB; RX Aerial= 16dBd; OVERALL TOTAL= 45dB. 24cm SITUATION (to get P4): TX Power..10W FM= 10dBW; TX Aerial= 20dBd; TX Feeder= -3dB; RX Noise Figure= -2dB; RX Feeder (masthead amp)= 0dB; RX Aerial= 20dBd; OVERALL TOTAL= 45dB.



All the above predictions ignore the effect of QRM on the picture quality. It is my experience that 70cm is usually interference limited because of the high level of 70cm narrow-band activity: (DX repeater working, excess power for local repeater access and OSCAR). Most of these can be coped with by IF filtering but this ruins picture quality. 24cm is largely free of QRM unless that is, you live within range of a 23cm Radar station. In any case the highly directive aerials used on 24 often keeps this to a minimum. The quality of FM pictures received on 24 is likely to be better than the AM ones on 70 since there are no linearity problems with the transmitter. The chances of causing TVI with MD-FM television are all but nil. Everyone I know who runs more than a few watts on 70 has had to cure at least one case of TVI.

CONCLUSION: If you get P4 or P5 from a station on 70 then you will do just as well (power for power) on 24 or, if lower power is used, you can make up the difference with more aerial gain. Picture quality on 24 will be much better and is likely to be QRM free. If you only get P1/P2 pictures it will not be so easy on 24. 24cm therefore should be the band and mode of choice for local TV. It is better than 70 in these circumstances. 70cm AM should be the band and mode of choice over more difficult paths, although the long distance performance of 24cm has yet to be established. The technology to get on 24cm FM is already here and several manufacturers have available equipment for that band. Aerials are becoming availalbe but be sure to get a broad band one or you may not be able to receive the repeater outputs. The same of course applies to pre-amplifiers. You should have a lot of fun being one of the pioneers on 24cm MD-FM TV and in a few years I expect this to be the usual band and mode that people think of when they talk about ATV. See you on 24 - de G8CMQ

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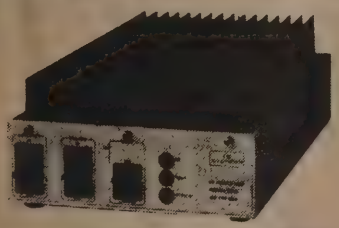

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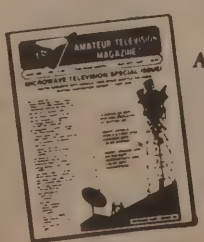

(Published Monthly)
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GRIFFIN ENTERPRISES ANNOUNCES NEW VIDEO DISTRIBUTION AMP BOARD-"DA-4"
Multiple use system can be used for VCR's, FSTV or SSTV!

Griffin Enterprises (P.O Box 6104, Sumter, S.C. 29150-6104) announces the availability of the new DA-4 Video Distribution Amplifier board. The unit has one video input that can be configured as a 75 ohm or high-impedance load, and four individually buffered output ports. In addition, it can be set-up for inverting or non-inverting operation. The gain can be adjusted from 0 to approximately 1.5, and the frequency response is flat to)5 Mhz. Differential gain and phase are negligible.

The purpose of a distribution amplifier, such as the DA-4, is to provide a means to drive multiple loads from a single video source without overloading. This means that your camera, VCR, or computer can drive up to 4 other devices simultaneously, such as a monitor, a scope, an ATV transmitter, or another VCR. The DA-4 is normally operated in the unity gain mode, but can be adjusted to compensate for high or low video levels.

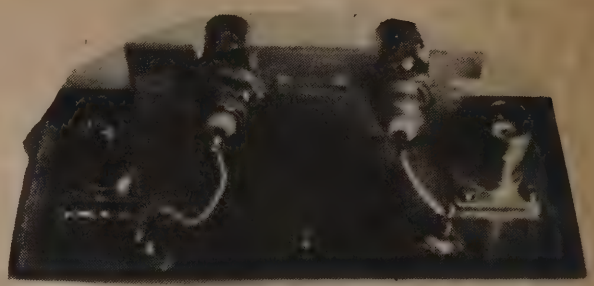
The inverting/non-inverting and hi/low input impedance options of the DA-4 also allow it to be used as a buffer amplifier to obtain video directly from the detector in a TV receiver and provide multiple 75 ohm outputs. This is ideal for ATV repeater use or snatching live commercial video for SSTV.

The DA-4 will be available in mid October from Griffin Enterprises...P.O. Box 6104...Sumter, South Carolina 29150-6104. The board and parts kit is $20.00. An assembled and tested version will be available for $30.00. Add $1.00 shipping and handling for each board. S.C. residents add 5% sales tax.

Proc-Amp Selling Well!

The "Proc-Amp 1" is designed to go in the video input line to your ATV transmitter. It has separate video and sync gain controls, which allow you to set the video/sync ratio to meet any demand. It can be used to remedy sync compression (see below), boost the video from an aging camera, and stabilize the pictue from VTR's with insufficient sync output. Since the video and sync gain controls are independent of one another and the sync does not disappear when the video is turned down, the "Proc-Amp 1" can be used to build a video fader for more professional looking productions.

Perhaps the area where this unit finds itself to be most useful is the compensation for sync compression. Have you ever had to back off on your power output to be able to transmit a decent 100/40 video/sync ratio? The problem here is that all amplifiers are non-linear. This means that as you raise the drive to your final amplifier stage, it takes more and more input power to produce a corresponding rise in output power. This shows up as compression of your highest power peaks, which are the sync pulses. On the receiving end, the picture becomes jittery, and if the sync compression is severe, the picture unlocks. The industry standared is 40 units of sync for 100 units of video and this ratio is what the TV receiver's sync and automatic gain control circuits are looking for.



Homebrewed W4CGC UHF Microstrip Monimatch SWR Indicator/Sampler built by WA4UMU & K4NHN (See "A5" Article July 84, Vol. 14 No. 7 and HAM Radio Magazine Article, December 1972. Send SASE for copies to "A5" Membership Services Dept.)

Assembled Proc-Amp-1 Kit Circuit Board designed by Griffin Enterprises (WA4UMU) Sumter, S.C.

Introducing The New

DA-4 VIDEO DISTRIBUTION AMP

From

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Have you ever wanted to feed several devices from one video source? The new DA-4 is designed to be fed with standard 1 volt video from a camera, VTR, TVRO, computer, etc., and provides four individually buffered outputs to drive your monitor, ATV XMTR, scope, VTR, etc. It can be installed into existing equipment or built as a free standing unit. Requires 12-15 vdc.

DA-4 Board and Parts Kit	$20.00
DA-4 Assembled and Tested Board	$30.00

Also available . . . The PROC-AMP 1. This in-line video processor regenerates sync and provides complete control over video and sync levels.

PROC-AMP 1 Board and Parts Kit	$25.00
PROC-AMP 1 Assembled and Tested Board	$35.00

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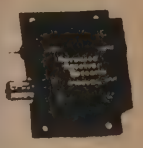
NEW HF FSTV NET ON 20?

It will happen only if you respond! 14.240 Mhz. Suggested

There has been talk about forming a FSTV auxillary HF frequency Net before. 7.290 Mhz. on Forty Meters was used one winter not long ago, but was limited to midwestern regional activity while the east and west coast had troubles "hearing" the Net. Several A5/USATVS members have once-again expressed interest in conducting such an ATV Net. The frequency of 14.240 Mhz. has been suggested as it is near SSTV and FAX "video" operating frequencies-so to possibly draw interested still frame TV newcomers. The FSTV HF Net could be used for the dissemination of ATV information as well as technical subjects. Local area activity updates and progess reports could be fed into the USATVS system. New gear and other operating techniques could be discussed including NBTV. OK, the ball is in your court-do you want it ATV'ers? Write to us and let us know. We will need of course Net Control Stations, so think about volunteering!

HIGH PERFORMANCE VHF/UHF PREAMPS

Receive Only	Freq. Range (MHz)	N.F. (dB)	Gain (dB)	1 dB Comp. (dBm)	Device Type	Price
P28VD	28-30	<1.1	15	0	DGFET	$29.95
P50VD	50-54	<1.3	15	0	DGFET	$29.95
P50VDG	50-54	<0.5	24	+12	GaAsFET	$79.95
P144VD	144-148	<1.5	15	0	DGFET	$29.95
P144VDA	144-148	<1.0	15	0	DGFET	$37.95
P144VDG	144-148	<0.5	24	+12	GaAsFET	$79.95
P220VD	220-225	<1.8	15	0	DGFET	$29.95
P220VDA	220-225	<1.2	15	0	DGFET	$37.95
P220VDG	220-225	<0.5	20	+12	GaAsFET	$79.95
P432VD	420-450	<1.8	15	−20	Bipolar	$32.95
P432VDA	420-450	<1.1	17	−20	Bipolar	$49.95
P432VDG	420-450	<0.5	16	+12	GaAsFET	$79.95
Inline (rf switched)						
SP28VD	28-30	<1.2	15	0	DGFET	$59.95
SP50VD	50-54	<1.4	15	0	DGFET	$59.95
SP50VDG	50-54	<0.55	24	+12	GaAsFET	$109.95
SP144VD	144-148	<1.6	15	0	DGFET	$59.95
SP144VDA	144-148	<1.1	15	0	DGFET	$67.95
SP144VDG	144-148	<0.55	24	+12	GaAsFET	$109.95
SP220VD	220-225	<1.9	15	0	DGFET	$59.95
SP220VDA	220-225	<1.3	15	0	DGFET	$67.95
SP220VDG	220-225	<0.55	20	+12	GaAsFET	$109.95
SP432VD	420-450	<1.9	15	−20	Bipolar	$62.95
SP432VDA	420-450	<1.2	17	−20	Bipolar	$79.95
SP432VDG	420-450	<0.55	16	+12	GaAsFET	$109.95



Every preamplifier is precision aligned on ARR's Hewlett Packard HP8970A/HP346A state-of-the-art noise figure meter. RX only preamplifiers are for receive applications only. Inline preamplifiers are rf switched (for use with transceivers) and handle 25 watts transmitter power. Mount inline preamplifiers between transceiver and power amplifier for high power applications. Other amateur, commercial and special preamplifiers available in the 1-1000 MHz range. Please include $2 shipping in U.S. and Canada. Connecticut residents add 7-½% sales tax. C.O.D. orders add $2. Air mail to foreign countries add 10%. Order your ARR Rx only or inline preamplifier today and start hearing like never before!

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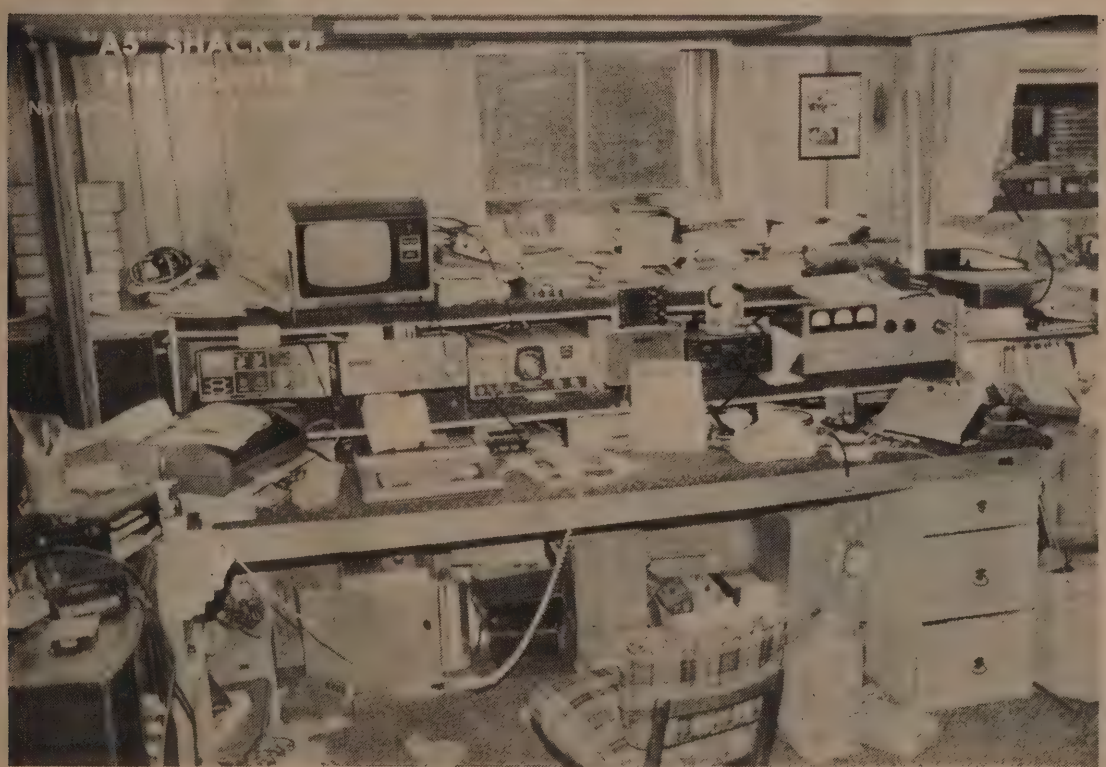


The Shack of Ulysess E. Draughn, Bluff City, Tennessee

WA4KMG walked up to our "A5" booth in North Carolina and demanded equal "Air-Time" for his questionable Ham Radio Shack. "I'm tired of seeing those "nice and tidy" ATV Shacks in "A5". Here's a real shack photo to use!" We see a TRSBOC Computer, some Dentron & Heathkit equipment. Sonewhere, there must be some ATV gear in there?

AMATEUR TELEVISION

NOW MORE STANDARD FEATURES . . . . STILL $399 DELIVERED

ALL YOU NEED IN ONE BOX

BUY THE MOST POPULAR ATV TRANSMITTER/ DOWNCONVERTER

TC-1 PLUS

SEE WHO YOU ARE TALKING TO! Show the shack, describe projects, run video tapes, computer programs, etc . . . in full color, sound, and in live action.

STANDARD FEATURES:

- **OVER 10 WATTS PEP RF OUTPUT.** Crystal controlled continuous duty transmitter. Specify 439.25, 434.0, 426.25 standard or other 70 cm freq. 2 freq option add $26.
- **BASE, MOBILE, or PORTABLE.** Use the builtin AC supply or external 13.8 vdc at 3 amps.
- **TWO VIDEO AND AUDIO INPUTS** for camera, VCR, or computer. Wide bandwidth for high resolution broadcast quality color video or computer graphics. Standard broadcast subcarrier sound which is heard thru the TV speaker. On-carrier audio optional at $40.
- **RECEIVE ON YOUR STANDARD TV SET** tuned to channel 3 or 4. Sensitive varicap tuned downconverter covers simplex and repeater freq over the whole 420-450 mHz 70 cm amateur band. Low noise NE64535 preamp stage.
- **VIDEO MONITOR OUTPUT** of your transmitted picture makes video gain, lighting, etc. adjustments easy & accurate.
- **ATTRACTIVE 10½ x 3 x 9 CABINET.**

SO WHAT ELSE DOES IT TAKE TO GET ON ATV?

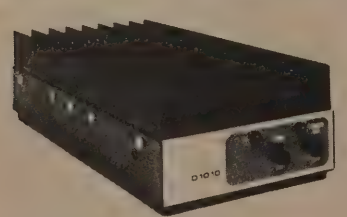
The antenna is really the secret to success with ATV. We suggest the KLM 440-27 Beam antenna with its high 14 dbd gain and wide bandwidth, and some of our Saxton 8285 low loss coax between it and the TC-1+. Antenna heigth at or above the tree tops makes a big difference. Line of sight DX is about 40 miles.

Any standard TV set is used as the receiver. The TC-1+ downconverts the 70 cm ham band down to channel 3 or 4. Just connect a short coax from the TC-1+ to the TV sets antenna input.

Any source of standard 1 volt composite video, such as is found in portable color or black and white cameras, VCRs, or computers can be plugged into the TC-1+ and transmitted to another station. Repeat SSTV to local ATVers. Audio can be from a low Z dynamic mic, or line level from cameras, VCRs, computers, etc.

Its really quite simple to have your own TV station capable of sending and receiving video 15 to 100 miles and more. DX with this set up is similiar to 2 meter FM with omni antennas.

THATS IT! It's easy!



ACCESSORIES:

Mirage D1010N 100 watt pep all mode amp	$289 del.
450 AEA Isopole omni antenna	$65 del.
Saxton 8285 low loss 50 ohm coax, 100 ft.	$41 del.
KLM 440-27 14dbd 70cm beam antenna	$89 del.

CALL OR WRITE FOR OUR COMPLETE LINE CATALOG

If you wish to build your own system, see module page. The TC-1+ contains the TXA5, PA5, FMA5, TVC-2L, & DM-1 module functions.

Tech class or higher license required for purchase. Normal shipment within 2 days on charge card or postal money order.

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TOM W60RG MARYANN WB6YSS 8-84

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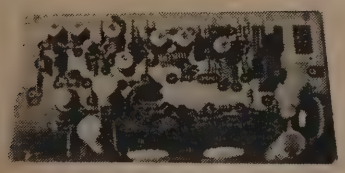
Build Your Own ATV Station With These Few Modules

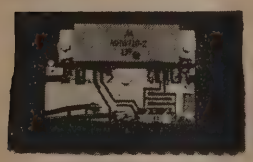
The Basic 3 Transmitting Modules (buy all 3 save $8) ...$199



TXA5-5

1. TXA5-5 ATV EXCITER/MODULATOR ..... $89 del

Wired and tested module provides 80 mw to drive PA5 10 watt power amp. High/low power switch for normal 10 watts with PA5, or adjustable for high power amps such as Mirage D1010N. Accepts standard 1 volt composite video from color camera, VCR, computer, etc. Wideband modulator gives excellent color and high resolution. Built in sync expander. Draws 70 ma at 13.8 vdc. One crystal included, but 2 freq requires another crystal at $15. We stock 439.25, 434.0, & 426.25 mHz, other 70 cm freq may take 3 weeks. CA-2 on-carrier audio module single freq, add $40. Two frequency $55.



PA5

2. PA5 10 WATT PEP ATV POWER MODULE .....$89 del

A Motorola MHW-710-2 is mounted on a heat sink with stripline PC board to give over 10 watts pep video when driven by the TXA5. 50 ohms in and out. Broadband, covers the entire 420-450 mHz 70 cm band with no tuning. Draws a little over 2 amps at 13.8 vdc reg.

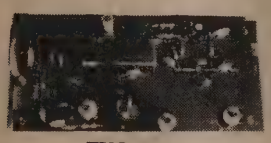
FMA5

3. FMA5 AUDIO SUBCARRIER GENERATOR..... $29 del

Transmits broadcast standard sound with your picture. Accepts a low Z mic (100-600 ohms). also line level audio from VCRs, camera mics, computers, etc. Up to 1 v p-p drive to the TXA5, VM-2, or VM-4 modulators. Works with any transmitter with 5 mHz modulation bandwidth. Draws 20 ma from 13.8 vdc supply.

All modules can be run from a 3 amp 13.8 vdc regulated power supply. A good UHF T/R relay should be used, we stock the Magnacraft W120X-14 at $44 delivered. The modules should be mounted in an aluminum chassis or cabinet for heat sinking and shielding. See chapter 14 of 1984 ARRL Handbook.

420-450 mHz ATV RECEIVING DOWNCONVERTERS



TVC-2

TVC-2 ATV DOWNCONVERTER .....$49 delivered

Wired and tested module connects between 70 cm antenna and TV set tuned to channel 2, 3, or 4. Varicap tunes the whole 420-450 mHz amateur band. Sensitive MRF901 preamp, stage digs out the weak ones and the hot carrier double balanced mixer resists intermods and overload. Requires +11 to 18 vdc at 20 ma.

TVC-2L more sensitive with NE64535 preamp stage ..... $59 del

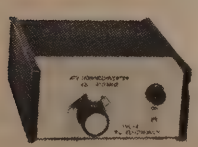
TVC-2G most sensitive with GaAsFet (.5db NF) stage ..... $79 del

It can be mounted in the shack, but is designed for antenna mounting for best sensitivity (Besides low noise figure, you gain the feedline loss). Has extra double tuned bandpass filter to reject strong UHF TV stations.

TVC-2G

DCB DOWNCONVERTER CONTROL BOX .....$59 del

Provides variable 10 to 18 vdc thru coax to antenna mounted downconverters such as TVC-2G and TVC-12G. Also has 15 db gain line amp to drive long lines or splitters. Ready to go, comes in same cabinet as TVC-4.



TVC-4

TVC-4 PACKAGED DOWNCONVERTER with AC supply... **$89 del**

Contains the TVC-2, 120 vac supply, ready to go. BNC antenna input and F connector TV output. Handy for ATV demos, or community TV systems outside of the USA. Size is 5.3 x 2.5 x 7 inches.

TVC-4L contains the more sensitive TVC-2L..... $99 del

***Attention clubs, groups and exporters ..... the following quantity discounts apply to one module ordered at one time and sent to one address: 5-24 10%, 25-49 15%, 50-99 20%, 100-up 25%.**

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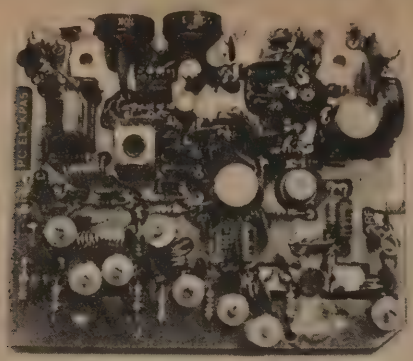
THE "KREEPIE PEEPIE" ATV TRANSMITTER IS HERE!



KPA5 1 WATT ATV TRANSMITTER BOARD FEATURES:

★ 1 watt pep minimum RF output on sync tip.

★ Full color and sound on one small 3.25 x 4" board.

★ Composite video input from camera, VCR, etc.

★ Runs on external 13.8 vdc at 300 ma supply or battery.

★ Wired and tested board covers 421 to 439 mHz.

★ Supplied with one xtal on 426.25, 434.0, or 439.25 mHz but capable of 2 freq operation with the addition of 2nd xtal (add $15). Other 70cm freq. available on special order.

★ Mic input from a low Z dynamic and line level audio input found in most portable color cameras, VCRs, or home computers provided.

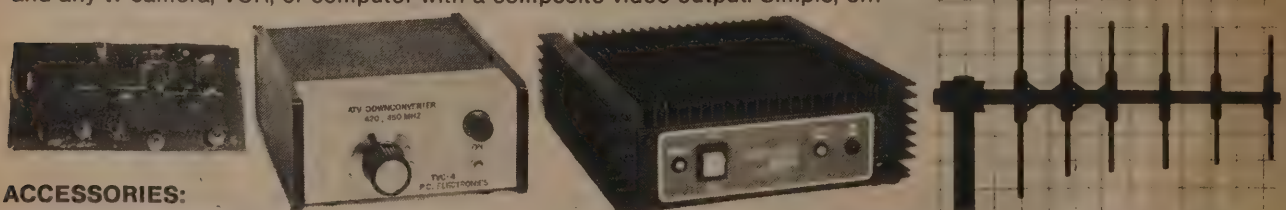
★ Schematic and application notes supplied for typical external connections, packaging, and system operation.

★ Price delivered via UPS surface in the USA is only **$159.** Technician class amateur license or higher required for purchase and operation.

DO SOME OF THESE APPLICATIONS INTRIGUE YOU?

1. PORTABLE CORDLESS TV CAMERA. No heavy VCR to lug around or cable length limitation. You can even use your home VCR rather than a portapak. Now you can creep around and peep thru your camera more easily. Gives good pictures up to a mile with simple whip, and 40 miles using beams in flat terrain.
2. MOBILE OR PORTABLE ATV for public service events such as races, parades, marathons, etc. A Mirage D24 40 watt amp can be added for greater mobile coverage or base operation. Mount in an airplane for CAP and rescue searches for an eye in the sky.
3. REMOTE CONTROL OF R/C AIRPLANES or ROBOTS. Fly with a camera in the nose to control as if you are in the plane. Likewise a robot can now be out of site of the operator.
4. REPEATER SITE SECURITY OR COMPUTER VIDEO DISPLAY. Turn on thru your repeater a camera at the site to see the area, weather, read meters, or if a computer is used, show status, play games, etc. by remote control. With all the new technology using TV displays, it is natural for hams to adapt these new products to transmission over the air. What applications come to your mind?

WHAT IS REQUIRED FOR A COMPLETE OPERATION SYSTEM? A TV set with a TVC-2 or TVC-4 420-450 mHz to channel 3 downconverter, 70 cm antenna, and coax cable to receive. Package up the KPA5, add 12 to 14 vdc, antenna, and any tv camera, VCR, or computer with a composite video output. Simple, eh?



ACCESSORIES:

Downconverter: TVC-2 wired & tested board $49
Varicap tuned. Requires +11 to +18 vdc at 20 ma.
TVC-4 (TVC-2 in cabinet with ac supply $89
more sensitive "L" versions with NE64535 preamp stage add $10.

Mirage D24 1 in / 40 watts out all mode amp. $179
450 ISOPOLE omni gain 70cm antenna $65
KLM 440-6 8 dbd gain 60° beamwidth antenna $38
KLM 440-27 14.5 dbd gain broadband 70cm antenna ... $89
100' roll Saxton 8285 50 ohm low loss coax $41
VOR Video Operated Relay board $25
80ØJ 10 pin Fem. Color Cam. Chassis Connector.... $10

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And there's more. Monthly features such as Ham Notebook, a collection of ideas, tips and small construction projects for your station and The Weekender, a series of short easy-to-build construction projects.

Every May there is our Annual Antenna issue. In November, we have our special Receiver issue.

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LET'S TAKE A CLOSER LOOK AT LOW- LOSS CABLE FOR UHF

Proper Installation Is the Best Thing You Can Do for your ATV Station

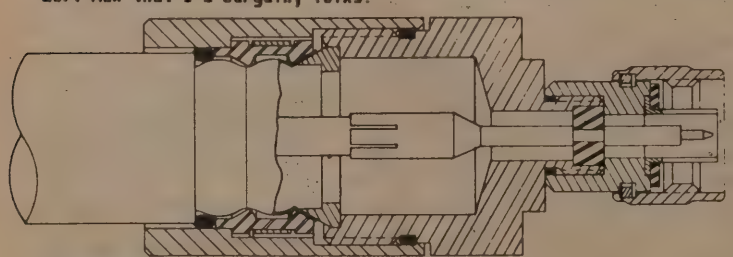
Perhaps the most important item in an ATV UHF system is good quality low-loss feedline coaxial cable. Just about every brand of RG8U type cable has the words "LOW-LOSS" imprinted on the protective rubber jacket. Some of it, I guess can be called low-loss versus using a piece of rope or a wet noodle. To determine how a piece of cable will work for your installation, you must either run actual tests or put faith in the manufacturers specs. Since most of us do not have the pocketbook to buy all types of brands and models of cable line, we can, at best, look at manufacturer claims and hope for the best (afterall, the testing comes after you have it placed in line, doesn't it?). The big mistake many ATV'ers seem to make is in the unnecessary purchase of double shielded line that runs about 20-25% higher in retail costs. If a terrible problem exists with commercial channel interference-then it might be worth a try, but to buy it just because it appears to be better coax, look at the specs-it just isn't. BELDEN 8237, 9251 and 9208, although expensive to buy, rates an unacceptable 4.3-4.7 db insertion loss per 100 feet at 400 Mhz. Even the double shielded models such as 8242 or 8268 have no better than a 4.7 rating with 9273 showing a whopping 9.2 db loss factor. The closest double shielded model coaxial cable that has respectable UHF loss figures seems to be 98% shielded 9888 with 3.8 db loss. So the next time someone tries to impress on you how good their coax must be at 60 cents per foot, have doubt. This is not to say that the above models of BELDEN coaxial cable is of bad design, quite the contrary, it is designed to shield out interfering signals and to weather protect the center conductors. There are other types of cable that serve a better low-loss factor. Let's look at some.

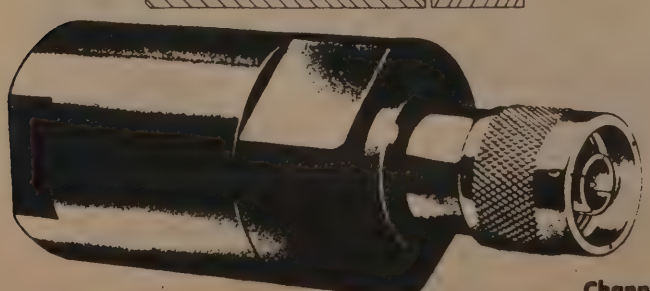
At best, 50% loss

For many years now, UHF'ers on SSB and ATV have all recommended nothing less than BELDEN 8214 or the more flexible and somewhat smaller SAXTON 8285 RG8U type coaxial cable rated 4.2 & 3.5 db loss per 100 foot at 400 Mhz. respectfully. Price is around 34 cents and 40 cents. At best, with properly installed connectors (there's something that could take another article sometime), the UHF'er will see half or more of his power disappear at the antenna. Take you BIRD wattmeter up there sometime and give it a try. It will ruin your day assuradly. Anything less than 8214 or 8285 is gone to the wind and poor performance will usually result, especially on the longer runs. And, that goes for transmit as well as receive! Using RG8U type flexible cables is assuming of course that you cannot (or will not) try to use hardline or heliaxal cable runs.

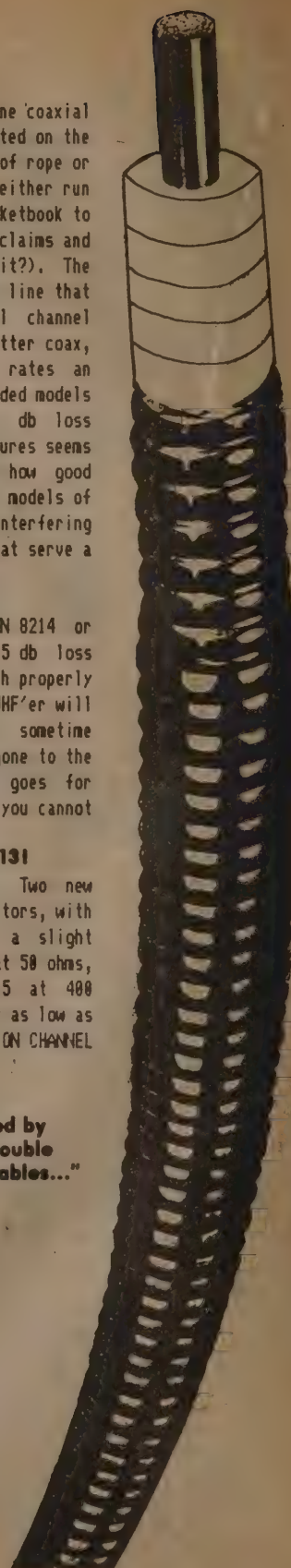
Move over Belden 8214 & Saxton 8285 - here comes 9913!

To the rescue (and just in the nick of time), there is good news on RG8U type coax. Two new models have been released by BELDEN and that show exceptionally low-loss UHF factors, with availability in the marketplace at reasonable prices! They are BELDEN 9913 & 9914. With a slight higher price, the 9913 model is the best $$$ buy for the money. BELDEN 9913 specs out at 50 ohms, 100% shielding at 1.3 db insertion loss per 100 feet at 150 Mhz., 1.6 at 200 Mhz., 2.5 at 400 Mhz.(!) and 4.5 at 1000 Mhz. Price? Not a dollar a foot, not even 75 cents per foot but as low as 39.93 cents per foot delivered if you know where to shop (see CERTIFIED COMMUNICATIONS AD ON CHANNEL 26). Now that's a bargain, folks!





"Don't be fooled by higher priced double shielded coaxial cables..."



Taking things just one step further (here goes pocketbook-hang on to your wallets), hardline cables such as ANDREWS, CONSOLIDATED or WELLFLEX in 1/2, 7/8 or 1 inch models saves even more precious db's of loss. WELLFLEX 1/2" is rated at 1.5 db loss per 100 ft. at 400 Mhz. with the 7/8" line rated at 0.8 db loss. ANDREWS 7/8" line usually specs a bit better depending upon where you get your figures from. Keep in mind, that's for NEW stuff, not 10 year old cable that has been thru several hurricanes, climbed on and shot at over 100 times. Someone in the audience at the Chicago National ATV Conference asked of Professor John Beanland (G3BVU/W1); "Where should I put my next batch of money-in an amplifier, a filter, a receive preamp or coax? John replied he would take the latter. Good coaxial cable helps on transmit bringing more power to the antenna system, on receive bringing the signal back down to the TV set and with interference emitting on both ends. One other closing thought; those ATV'ers who go to all the trouble and expense to get extremely low- loss and then use "homebrewed" connectors should be "shot" at sunrise! I have yet to see anyone duplicate the "inside tapers" and machine work that is so important with commercial grade connectors. Come on fellas, another $50.00 can't hurt all that much can it? 73's -WB0QCD

CERTIFIED COMMUNICATION

RG/U CABLES	RG/U Nos.	ATTENUATION attenuation 10	50	100	200	RATING db/100 Feet 400	at (Mhz) 1000	3000
6A		.84	1.9	2.7	4.1	5.9	9.8	23
8,8A,213		.55	1.3	1.9	2.7	4.1	8	16
Belden 9913	*	.	.64	1.0	1.6	2.5 *	4.5	—
Belden 9914		—	1.1	1.6	2.4	3.5	6.0	—
Belden 9888		.6	1.2	1.7	2.7	4.2	7.8	14.2
Beldon 8214		.6	1.2	1.7	2.7	4.2	7.8	14.2
8X		1.1	2.5	3.7	5.4	8	13.5	26
9,9A,9B,214		.66	1.5	2.3	3.3	5	8.8	18
11,11A		.66	1.6	2.3	3.3	4.8	7.8	16.5
14,14A,217		.41	1	1.4	2	3.1	5.5	12.4
213,219		.24	.62	.95	1.5	2.4	4.4	9.5
Belden 9915		—	.6	.8	1.2	1.9	3.5	—
34, 34B		.32	.85	1.4	2.1	3.3	5.8	16
55B,223		1.2	3.2	4.8	7	10	16.5	30.5
58		1.25	3.15	4.6	6.9	10.5	17.5	37.5
58A,58C		1.4	3.3	4.9	7.4	12	24	54
59,59B		1.1	2.4	3.4	4.9	7	12	26.5
62,62A		.85	1.9	2.7	3.8	5.3	8.7	18.5

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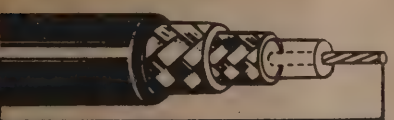

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TENTH ANNUAL EASTERN VHF/UHF CONFERENCE ANTENNA RESULTS LISTED

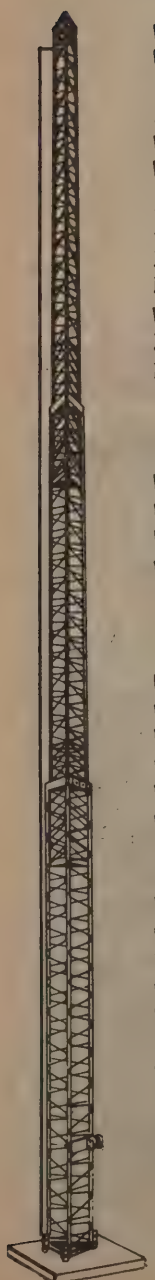
In our recent September 1984 Vol. 14 #9 issue, we presented the results of the Antenna Gain Measurements at the Central States VHF/UHF Society Conference (Cedar Rapids, Iowa). These figures are interesting to users of VHF/UHF frequencies as they act as a true guideline on equipment performance tested by impartial parties. There is always, however, room for marginal error. Each test is very dependent upon weather conditions, surrounding buildings and lay of the land, equipment functionability and of course the accuracy and knowledge of those who do the testing. At our Fall Chicago Nat'l ATV Conference, John Beanland G3BVU/W1 gave us copies of the results of such tests out east. He pointed out to us that K1FO's entry in 23 cm. was a 29 element loop yagis (not defined). The comparison between it and longer 45 element models is impressive. While the CSC measurement's on the 24 ele. CC Boomer was 16.3, the ECC rated 15.7 db. K2RIW's were exactly the same at 15.2. Interesting reading. -QCD

Results of Antenna Gain Measurements at the Tenth Eastern VHF/UHF Conference

Call	Antenna Type	Gain
	70 cm (Notes 1 & 2)	
W1JR	28 element 9.25 wavelength Yagi with 1" boom, ins. elements	16.9 dBd
W1JR	28 element home brew Yagi 9.25 wavelengths (broken feed sys)	16.2 dBd
K1WHS	24 element Cushcraft model 424B boomer	15.7 dBd
K1FO	Cushcraft 424B	15.5 dBd
W1JR	21 element F9FT Yagi	15.2 dBd
W1JR	19 element K2RIW Yagi	15.2 dBd
K1FO	19 element K2RIW Yagi	15.1 dBd
K1FO	Cushcraft 424B with single reflector	14.9 dBd
K1FO	K2RIW 13 el Yagi	13.3 dBd
K1FO	NBS 3.2 wavelength Yagi	12.8 dBd
WA1YKN	3.2 wavelength Quagi	12.7 dBd
K1FO	NBS 3.2 wavelength with one extra director	12.5 dBd
N1BWT	EIA reference standard (note 1)	* 7.7 dBd
	33 cm (Note 1)	
W1JR	33 element loop Yagi 12' long	14.0 dBd
W1EJ	33 element "Super-Yagi" 11' long	13.0 dBd
W1EJ	15 element Yagi	10.5 dBd
W1EJ	EIA gain standard (note 1)	*7.7 dBd
	23 cm (Note 1)	
W2VC	4 by 45 element loop Yagis spaced 29" and 28"	24.3 dBi
W2VC	45 element W1JR design loop Yagi	20.9 dBi
W1JR	45 element loop Yagi	20.8 dBi
WA1TFH	45 element loop Yagi	20.7 dBi
W1JR	45 element K9KFR built loop Yagi with supporting braces	20.2 dBi
WA2LSE	45 element loop Yagi	20.1 dBi
K1FO	Spectrum International loop Yagi	19.7 dBi
K1FO	23 element F9FT Yagi	18.7 dBi
WA2LSE	24 element loop Yagi	17.0 dBi
WB1FKF	45 element loop Yagi	16.0 dBi
N1BWT	Reference horn	*15.4 dBi
W1JR	32 element J slot antenna	13.8 dBi
WA1TFH	K2VXO 10 over 10 skeleton slot	13.3 dBi
K3BRS	Double figure "8"	12.2 dBi
WA1TFH	K2VXO 12 turn helix	11.2 dBi
K3BRS	Boetie	9.1 dBi
K3BRS	Extended sauerkraut can	7.9 dBi
K3BRS	Short horn (green pea can)	7.4 dBi

May 6, 1984

* Reference Standard



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BUILD A FSTV TO SSTV "A5" REPEATER!

First Glance Brings Doubt, But Creativity Brings Interest

UHF HAM TV IN/VHF SSTV OUT

Now before you think we've lost our marbles, think about it for a bit. There are a number of areas around the country where SSTV dominates over FSTV operation. Likewise, some foreign countries have limited UHF spacing for an inband ATV repeater project. Why should two "A5" mode groups operate their favorite visual communications without getting together? Wouldn't a SSTV link into 14.230 on twenty meters be interesting? Many ATV'ers have both FSTV and SSTV capability. Putting up a FSTV inband repeater is a very difficult task, especially if there is little support in help as well as finances. For already established FSTV groups, a SSTV link means new faces to "see" and maybe-just maybe new FSTV'ers? Remember not long ago the Australian FSTV to SSTV (HF) to FSTV (California) linkup tests? Now that the laughter has died down a little, let's see what it takes to accomplish such a project.

Used SSTV digital to analog converters have really dropped in price. The once popular ROBOT 400 models ran $895 but now can be found from $100-250. Some HI-RES WRAASE units are floating around for $500-600. With COLOR SSTV gaining popularity, Black/White converters are plentiful. The first decision that must be made is resolution over quick pictures. FSTV'ers are used to high-quality 525 line resolution-but will they wait 52 or 70 seconds for a good picture? Perhaps quicker 8 second 128X128 res. pictures will show more action. Maybe now someone can experiment with faster 4 or 2 second SSTV frame rates on VHF/UHF where wider bandwidths are allowed? The video output from FSTV TV monitor (or DM-1 sampler type board) can be used to bring the signal into the camera input of the SSTV converter. The SSTV converter will snatch a fresh picture every few seconds. Output is in audio tones perhaps on a favorite two meter frequency. Everyone uses two meters for audio coordination don't they? Even the FSTV audio subcarrier can be relayed onto the SSTV frequency.

This mini-article is just to get the thought process working. A long winter is ahead and such a project might just prove interesting. If anyone tackles the idea-write to us and let us know how you came out, okay? -A5

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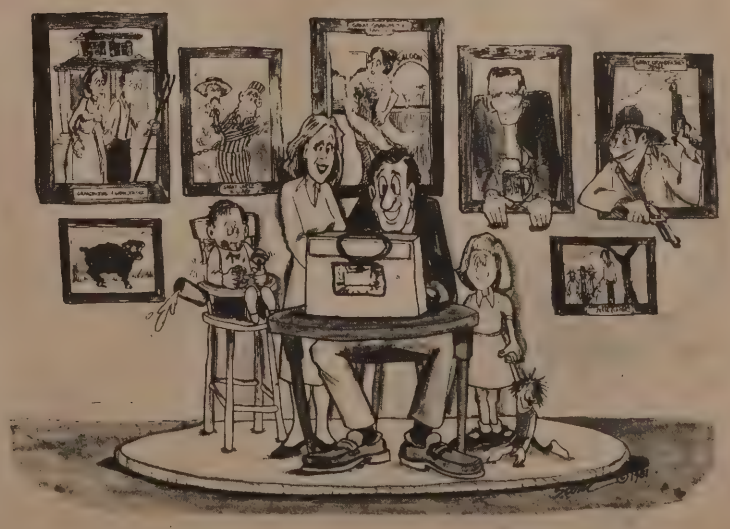

Everyone "Tunes into A5" for the lastest in ATV news!

"SSTV-ON-THE-BANDS"

Don Fuller W2WHK
210 Utica Street
Tonawanda, New York - 14150

Send your SSTV pictures and shack photos to W2WHK for publishment in "A5"

Recently, QRM to SSTV has been reduced. The persistent use of 14.230 Mhz. by Slow Scanners, indicating the desire to remain on this frequency, may have paid off. Let us hope so, as the interference was very malicious and unnecessary. One problem still exists, but is of short duration, so should not prove to be any great difficulty. That is the "PHO NET", which operates on 14.227 Mhz. at 10:00 a.m. EST. Prior to the band change, Bill Bennett, (W7PHO) had conducted this net much lower in frequency. But he wanted to cover the "Generals" so that is the reason for its present operating frequency.

FAX NET- I checked into the FAX net some time ago and had a nice contact with several fellows including Clay (K6AEP), who was transmitting some weather satellite photos using Slow Scan television, using the resolution 34 sec. frame. The pictures showed remarkable detail. This sounds like a good mode, and I am sure that interest will pick up as FAX becomes available to more of us. I have heard some sending FAX pictures on 14.245 Mhz. on several Sundays. I still don't have this capability. According to hear-say, Clay has purchased a Robot 1200 C, so has joined the increasing number of "1200's" that can be seen on the bands.

VIDEO SCAN 1000 COLOR BOARDS- Both Don Miller (W9NTP) and Sam (WA7WOD) will be producing color boards if sufficient interest is shown by those using the Video Scan 1000. Sam and Jim (K4TGC) can be heard and seen experimenting with color, swapping color, R,G,B using this Scan Converter.

W8ASF MODS- Fred Sharp (W8ASF) has a "Robot 400" modification for the 34 sec. mode. Fred has developed many projects and has been very helpful in designing equipment for SSTV. I get my information second-hand because Fred and I are geographically too close for direct contacts on 20 mtrs. Keep up the good work, Fred.

QUASAR" TV for R, G, B- Color- I own a Motorola TV which has the same circuitry as the KMC (K-MART) television. This receiver can also be modified for R,G,B color. The following diagram can be used for defeating the front end of the television, when using the TV as a video monitor, when using a color camera. It allows you to accomplish this without cutting a foil in the TV set.

W1JKF NET- Band conditions still don't favor Western New York for copy on Brook's Saturday afternoon Net. But I listen in every week, hoping for improvement of conditions, so that I may be able to check in again.

ROBOT 1200C- There is an increase in SSTV activity with 1200C appearing on the scene in increasing numbers. Copy is very good on the Video Scan 1000, but the picture is somewhat narrow. Resolution is high quality in the black and white. I am unable to give a personal report on color performance, though reports from the fellows using it are very good. K6AEP is starting a 4-part series in "A5" on using the ROBOT 1200C with the IBM Personal Computer.

KC0OR- Alan Burry has been active in Slow Scan since 1981 when he started using an "ole P-7" Venus monitor and camera. Ten meters was his favorite band, and he had many hours of enjoyment before ten meters folded. Today Alan uses the SC 422 Volker Wraase 2 membory B/W Scan Converter, an RCA 003 B/W camera, the TRS80C with Bob Wilson T/R board and XG 80 color display board. Software for the computer was provided by K6AEP's 7.6 program. He also has a home brew JA0BSZ designed converter which is still being use on occasion. His "Shack" picture shows a very neat layout. His transmitter and receiver are the Drake B-line twins. His antenna is a 4 element tri-band beam at 55 ft.

Alan is busy on the farm and ranch during the summer, but will be active again during the winter months. I will be looking for you this winter on 14.230 Mhz. Alan. Keep those cards, photos and letters coming fellow SSTV'ers! 73's de W2WHK

***(See Circuitry for this Mod on Channel 33)**

Channel 28 SSTV Shack of Alan Burry KC0OR-Keensburg, CO

THE MICRONEYE TV CAMERA

Experimental Device Might Be The Answer For TRS80C* SSTV Enthusiasts?

Going thru some back issues of Hot CoCo Magazine (May 1984 issue), we found this interesting article. K6AEP and a number of SSTV'ers have been "talking" about the possibility of interfacing some sort of camera to the Radio Shack TRS80C Color Computer for many years now. Perhaps this is the answer? We present an edited portion of this article here for the A5 SSTV/Computer enthusiast.

The MicronEye costs $295.00 and requires a 16K, Extended Color Basic CoCo. Write Micron Technology, Inc., 2805 E. Columbia Road, Boise, ID. 83706; phone (208) 383-4000.

by Scott Norman*

The Color Computer's senses are developing nicely. It has been easy to generate reasonably good speech for some time, and at least one voice-recognition program is available. Now, an innovative and affordable product makes it possible for lucky CoCos to acquire vision to go with their speech and hearing.

The product is the MicronEye, a relatively inexpensive video camera based on a new concept in solid-state imaging devices. With the appropriate hardware interface and driver software, it can transmit binary images to a computer where they can be displayed, stored, or manipulated by additional software. This opens up many possibilities in pattern recognition, laboratory applications and other areas.

When I say binary images, I am referring to visual appearance, in addition to the language of ones and zeros by which the computer operates. On a black and white TV receiver the images themselves will appear in strict black and white. The MicronEye has no gray-scale capability, although there are programming tricks that mimic such effects.

The camera's developer, Micron Technology, has thus far produced two different physical packages for its product. There are interface electronics and software drivers tailored to the Apple II Plus, IBM Personal Computer, Commodore 64, and the CoCo (photo 1). Yet another model of the MicronEye can be used with any computer capable of supporting an RS-232 port.

While the MicronEye is available for the CoCo, no one claims that it can simply be plugged in and used in some revolutionary application. A lot of software development is needed before that happens. Who knows, perhaps this piece will inspire someone to do just the job.

The key to Micron Technology's ability to manufacture such a reasonably priced product is their proprietary image-sensing array, known as the OpticRAM. In essence, this is a 64K dynamic RAM with a window in the top of the package (photo 2). Silicon's inherent photoconductivity is employed to make image sensors out of the individual memory cells.

Photo 1. The MicronEye bullet model and its electronics module.

The MicronEye's circuitry controls the entire charge, expose, measure, recharge cycle. It also has to perform a fair amount of signal processing to map the physical pattern of the chip's memory cells onto that of the computer's video display. The OpticRAM contains a pair of sensing arrays, each 256 elements long and 128 elements high, separated by a nonphotosensitive strip about 25 elements wide. The sensor arrays are actually five times as wide as they are high, however, and cannot simply be mapped onto the display without considerable distortion.

The software furnished with the MicronEye gives you the choice of displaying the information from just one array (the bottom one) or both. Although the two-array scheme fills more of the CoCo's screen with imagery, the images do not match at the boundary because of the gap between the sensors. Differences in sensitivity across the chip can also make it difficult to find control settings, which give a completely satisfactory image in this mode. For critical work, it is often best to stick with a single imaging array. Several choices are available for the resolution of the final image: 512 by 128 elements (the left half of this image, that is), 256 by 128, 256 by 64 and 128 by 64.

I haven't even touched on the purely graphics aspects of the MicronEye. It should be possible to use it as one element in a computer graphics system, allowing the artistically inclined to create video images at least partially derived from hard copy. Use of the CoCo's coarser-resolution modes would permit color variations to enhance MicronEye imagery, as well.

These are just a few thoughts about the possibilities of this interesting new device. Like the computer itself, the MicronEye is likely to flourish as more and more people have the opportunity to work with it and to generate their own ideas.

Copies of this article in it's entirety may be obtained by A5/USATVS Members with a SASE to; A5 Membership Services, P.O. Box H, Lowden, IA. 52255. *Address correspondence to Scott Norman, 8 Doris Rd., Framingham, MA. 01701.

An Inside Look at the Robot 1200 Hi-Res. SSTV Converter!

How to Match it with an IBM PC Computer

by Clay Abroms K6AEP
1758 Comstock Lane,
San Jose, California

Part one of three

This article is the first of a three part article written exclusively for A5 magazine. This article will describe a method of combining a commerical slowscan converter (Robot 1200) into a complex display system. The article will explain the design considerations required in such a project and to give a little inside look into the Robot 1200 design. The second part of the article will provide an interface to the 1200 to a popular computer system (IBM PC). Part three will provide a software package will allow a person with moderate amount experience to modify and expand upon.

A High Resolution Display System

Some Background

It became very obvious after the completion of my TRS-80C projects (ref 1) that the display had some limitations in display quality. If a system was to be developed with higher resolution a new approach would have to be take.

First of all why would anyone need higher resolution ? Standard SSTV does not require more resolution. The majority of the pictures sent on 14230 are of such poor quality and subject material who needs more resolution. Besides with all the QRM on the low frequency bands like 14230 Khz you are lucky to receive any picture at all, let alone a high resolution one. When the 10 Meter band finally opens up again this would be an ideal place for daytime high resolution picture transfer. I have found 14230 Khz is usable after 8 PM PST. Most of the jammers, carriers, and other assorted QRM leaves the band. After that hour I have received good quality pictures.

Another application for high resolution displays other than SSTV is FAX and Fast Scan TV. Before discussing hardware lets first explore what is required for a high resolution system. The first critera is to have a digital display with at least 256 pixels per line and between 240 and 256 lines of vertical resolution. This criteria was established after much trial and error experiments on the TRS-80C projects.

A number of people have speculated on how a picture would look with 512 pixels per line. Experimentation in a industrial environment has determined that a standard TV can display only 320 pixels per line. However the complexity and cost of a system with 512 pixels per line can be up to 4 times that of a 256 pixels per line with only a two times improvement in image quality. Why would such resolution and higher costs be required ?? In the commerical world it is required. For vertical resolution standard TV is approximately 240 lines of interlaced video. To display 525 pixels per line color will require an expensive RGB monitor. Even a standard TV camera will not provide the resolution required for the capture of high resolution images of 512 by 512. A high resolution camera and monitor could cost thousands of dollars. This situation may improve with time ?

Once you are satisfied that a goal of standard US TV resolution is adequate, a display system can be selected more rationaly. The second criteria for digital display systems is the number of gray levels per pixel. Experiments which I conducted over the years indicated that for high resolution pictures 4 bits or 16 gray levels is marginal. A better criterion would be 64 gray levels per pixel. If this pixel density could be applied to three image planes, the image when combined into color TV would be also equivalent to standard TV.

When I first investigated a system like this a number of commerical systems were found form Colorado Video and Matrox, but their costs were excessive. Most systems were in the range of 5000 to 10,000 dollars. Obviously, this was beyond my pocket book.

After completion of the TRS-80C high resolution board, and the addition of extra memory, I determined that to develope a higher resolution system required more free time that I had. Working 8 hours per day in the electronics industry cuts into you ham radio activities severely. I enjoy spending some time with my family, and my real hobby is software development not hardware. I get enough hardware experience in my real occupation of Electrical Engineering. To design something as complex as the 1200 takes facilities beyond that of most home hobbiests. Even if you were to copy the Robot design the prototypeing and debug could be a major sink of time and money. Why bother, the retail cost of the electronics parts of a Robot 1200 cost almost as much as an assembled and tested unit.

With this background in mind lets look an an easier way to obtain a high resoluton system. The easy way in the 1984 ham tradition, is pull out your check book and buy one. All hams know that nobody builds anything any more! If the product doesn't work as described in the instruction manual you ship it back to the manufacturer, then you bad mouth it over the air. Just listen on 14230 Khz you can hear all sorts of bad mouthing of products. When I received my amateur call in 1952 things were very different. Enough of this kind of stuff.

The Hardware

Apparently, Robot Research Inc, also determined that this sort of hardware display design criterion was desirable. As a result they started shipment of the Robot 1200 system in late August 1984. Another thing which Robot included is a computer interface, which makes the whole box useful. The suprising thing is that their price was approximately one fourth of the cost of the their commerical counterparts. However, they chose to include their own SSTV formats for reception and transmission inside the microcode of the unit. These formats are greatly different than those currently in use by most home brew systems currently on the air. I'll discuss this subject later on in this article.

The Robot 1200 is quite an engineering marvel. Robot decided to place most the features we have enjoyed in computer based systems inside the 1200. You can use the unit as a stand alone device, or attach it to a computer system. in fact the Robot 1200 is a stand alone microcomputer system by itself.

The 1200 system consists of a Microprocessor, Display , and Camera interface. Robot decided to use an Intel 8051 microcontroller which was a wise choice. This processor has a rich instruction set, and many features included on the IC like parallel ports, async port, and a timer. Inside their microcode they make use of all of these features to perform tricks in video processing and video I/O.

The SSTV is received thru an analog filter and a 8253 which is interconnected as a zero level crossing detector. The time of each sine wave crossing is detected and loaded digitally into the microprocessor. I must admit I was not very impressed with the performance of this detection scheme, I think the old Robot 400 performance was better in this area. An 8255 IC (24 Bit port) is also provided as an I/O device to the system for interconnection to another computer system. The SSTV output is cleverly done by using a serial port in the 8251 microcontroller. All that is required is to filter the signal and connect it directly to a transmitter. An 8279 IC is used to connect the front display switches of the unit. This IC is commonly used as a keyboard interface IC. The 1200 microcode reads these switches once and places their position in a location in the 128 bytes of RAM inside the microcontroller. In this way the keyboard can be scanned frequently and the keyboard table updates as different selections are made. The microcode inside the 1200 is contained on a single 27128 EPROM. This 1200 microcode would be a excellent area for some experimenter to investigate and modify for some future undefined application.

One interesting 1200 mod might be to install FAX reception in the 1200. This modification would require external hardware, which could be added to the 8255 port. The 27128 EPROM could be revised for this application.

A very interesting thing to note is that Robot placed facilities in their unit to expand the memory and EPROM capability. The 1200 currently has 64K of RAM which is 18 bits wide. The RAM bank is designed such that 256K RAM IC's can be directly installed. These RAM IC's currently cost $30 each. I'm sure their cost will drop in the future. If this was done 4 high resolution pictures could be received instead of one. Of course this would take a microcode change. Could the 1200 some day be a Robot 2200 with higher resolution??? Only time will tell. It would be nice if this feature was field upgradeable.

In the future the 1200 should provide a base for home experimentors. Unlike the mods made to the old Robot 400, the 1200 mods will be software changes, which can be easly made by burning new EPROMS. After all the Robot 1200 is a small microcomputer system programmed for only one application. It is very similiar to the TRS-80C system however it is much smaller and less flexable.

The display portion of the unit is similar to the one designed for the TRS-80C (Ref 1). Two major differences are noticable: 1. The display memory is dyanamic RAM as opposed to static RAM used in the TRS-80C display. 2. The address by which the microcontroller DMA's into the display memory is controlled by the 6845. In the TRS-80C display TTL counters are used.
Each pixel inside the display memory is configured for 6 bits of resolution. The total display memory of the Robot is contained in 256 X 240 X 3 or 184320 pixels of six bits each. This configuration represents the maximum resolution of the unit. The microcode of the 1200 allows the display to be configured in other modes for lower resolution reception. In all cases the picture is digitized to six bits which greatly improves resolution.

The color display modulator is similiar to the TRS-80C display board in another respect, that both units use a LM1886-LM1889 converter modulator configuration. The 1200 uses multiple 1886's to convert the RGB information into the TV picture components which are required by the LM1889 modulator.

The camera portion of the 1200 is unique. The video signal is first fed into standard TV type front end. The front end consists of a few high density video RCA IC's which perform the conversion of composite fast scan video to their components. This front end is similiar to that used in a convential TV set. A RCA Flash ADC (Analog to digital converter) is next used convert these signals to digital information which is DMA'd into memory of the display memory.

The most exciting portion of the unit for a computer buff like myself is the computer interface. Two computer interfaces are provided in the unit. One interface is RS-232 serial and the second is parallel. The serial interface allows access of all commands which control and provide picture processing of the computer. The parallel interface covers the same commands as the serial but also includes commands the move data back and forth. Also inside the 1200 is a character generator. This feature allows characters to be overlayed on pictures or placed on the screen as graphics. some of the computer commands include zoom, picture inversion, read pixels and write pixels individualy or in a stream, and picture printing. The only portion of the unit which cannot be accessed from a host computer is the SSTV receive. To receive pictures in another SSTV format will require first receiving the picture into the host computer then transfering them to the 1200.

The parallel interface consists of eight bits out with some handshake lines. Robot with their great wisdom allowed the computer to access all portions of the 1200 memory and controls. This provides a novice computer programmer with the ability to capture pictures, transfer them to the computer and process them. Another neat feature is that Robot provided the programmer with the ability to access the VCO (Variable Frequency Oscillator) in the 1200 through software. This feature allows a programmer to capture a picture into the 1200 , then transfer the image to a standard host microcomputer and transmitt it on SSTV from the host computer throught the Robot 1200 in a more convential manner at any SSTV rate desired. This will be an ideal method to transmit pictures in formats other than those microcoded in the 1200 by Robot.

Conclusions

The results so far experienced with the Robot 1200 show that its performance is more than I expected. The analog image captured from a color TV camera is identical to the digital image displayed on the monitor attached to the 1200. I have found the picture quality on closed circuit SSTV pictures over the air (14 Mhz) is now as good or or better than Fast Scan TV on 434 Mhz from a station 5 miles away. I found this difficult to believe at first.

The parallel computer interface performs as expected, but it is a little slow. This is because of the DMA techinque employed by Robot inside the 1200. Only one pixel can be transfered from the display memory per horizontal fast scan display line.

The most negative aspect of the unit is the composite SSTV format selected by Robot. The formats were probably generated by Robot to make it difficult for competitors to duplicate their units, and to save on hardware costs. No technical justification can be determined for Robots decision in this matter. The composite SSTV formats selected by Robot are similar to the WOLMO formats described in A5 magazine. The only twist which Robot introduced was to add the luminance and chrominance components.

However, it is likely that these formats will be used extensively in future SSTV transmissions due to the large number of Robot systems which will be appearing on the air. It is obvious that the Robot 1200 will be the next quality standard in SSTV. I can't imagine how any other system could compete with the 1200. Technology will probably force the 1200's price downward but the image quality of the unit places it in a class by itself.

Stay tuned to A5 magazine for the next article in this series to see how easly a computer can be interfaced and programmed for this unit. Although I will use a IBM computer, others can be programmed to do the same type of thing.

References:

1. A SSTV/FAX system, 73 Magazine, September/October, 1984

By: Clay Abraas K6AEP and Dr. Ralph Taggart WD8DQT

"Stay tuned to A5"
in our December issue:
Part Two - K6AEP
Robot 1200 Commands, Memory, Serial Interface, Parallel Interface, Homebrew Digital Analog Card, Schematics, and more!

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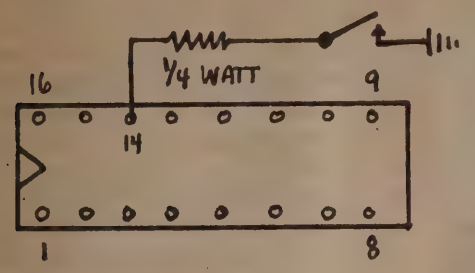
Channel 32

W2WHK QUASAR TV SET MOD

For R-G-B Color SSTV
Chassis #TS-993 Service Model #WP2132TW



IC101
Video Prod.

Be sure chassis no. and service model are the same. Some sets with close numbers are not compatible. (From Channel 28)

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SSTV

JG1DDT 神原克彦

JG1DDT is our "A5" Japanese Foreign Representative and sends us monthly reports on what's happening on SSTV, RTTY, EME and FAX in Japan. We see, from time to time, several USA SSTV Callsigns appearing in the SSTV WORKED & VIEWED column. Shown here is a partial listing of some of these listings from 1984 issues of CQ-JA MAGAZINE. Look closely, is yours there? Also featured recently was Richard Thurlow G3WW of England and a short synopsis on his SSTV station equipment.

シャック紹介

G3WW, Richard OMと彼のシャックです。1905年6月28日生。ハム歴65年のSSTV界で、最も著名なリーダー。常にSSTVの最新装置を手掛けられており、最近はRobot1200Cのデモに立合いました。さらにSC-1のグレード・アップに、と活躍の現役。JAのサービスもよくしてくれ、最新のSSTV資料を集めて、便りを寄せられています。

(ed).

SSTV'ers should listen and watch more for foreign stations. Many of those troublesome QRM stations just might be SSTV DX'ers trying to break in (right XE1L?)!

SSTV WORKED & VIEWED. △は VIEWED.

AH2AQ	1547	14227	JA1PGM	△LZ4MH	0452	14230	JA7BAL
AH2AR→7	2225	14232	JA1XVY	△OE3IBW→7	0720	14233	JA3CF
CE2AFI	2302	14230	JG1DDT	△PA3ARX	0542	14235	JA7BAL
DJ1IJ→7	0150	14230	JH8CFH	PY2OB	1603	14230	JA6YAP
F3HD	0245	14230	JH8CFH	SP2JPG→7	0626	14230	JA1PGH
△F3RT	0506	14233	JA7BAL	VE7ATN	1610	14228	JA1PGH
F6FPQ	0537	14230	JA7BAL	YU2RVI	0520	14230	JA7BAL
△F8KN	1640	14230	JA6YAP	ZL2AUJ	1720	14230	JA1PGH
△GM3PPX	0540	14233	JA7BAL	ZS6BTD→7	0005	14233	JA3CF
△IC8POF	0506	14228	JA7BAL	4S7RM→7	2325	14231	JH8CFH
N5CST	2120	14340	JA3CF	DJ1IJ	2120	21340	JA3AKT
KH6PO	0554	14230	JR1UDK	△DL8AC	2040	21340	JA6YAP
KX6PO	1838	14230	JA7BAL	WB2PTH	0901	21339	JR3VMJ
WB6QWC	1619	14228	JA1PGH	VK6AOK	0753	21340	JR3VMJ
W6TWT→7	1823	14232	JA7BAL	YU5XKS	0150	21341	JR3VMJ
LZ2OV→7	0219	14230	JH8CFH	ZS6BTD	2200	21340	JR3VMJ
DK7LD	0638	14230	JA7BAL	ZS6BTD	1400	14233	JA1XGI
DL7FAU	0603	14230	JA7BAL	AG8O	1010	28685	JA1XGI
△EA3BBS	0450	14300	JA3GXD→7	DF2GP*	1733	28679	JA1PGH
EA5VT	0555	14230	JA1XGI	DF3SJ	1751	28679	JA1PGH
F5WS	0700	14230	JA1XGI	DF9MD	1703	28685	JA1XGI
G4CGH	0450	14235	JA1XGI	DK2WP*	1700	28685	JA1XGI
△I3XQW*	0635	14234	JA8DWY	DL8AC*	1748	28679	JA1PGH
I8AA	0735	14230	JA1XGI	F5WS	1803	28685	JA1XGI
WA2SZQ	2101	14230	JA1XGI	HR2HH	0850	28680	JA1XGI
W3ZPH	1905	14230	JA1XGI	I3IVI	1630	28685	JA1XGI
WB6QWC	1820	14230	JG1DDT	IV3OLW	1645	28685	JA1XGI
WA7WOD	2000	14230	JA1XGI	KA1BGC	0941	28682	JA1PGH
WØDQ	1500	14230	JA1XGI	K1CBO	0905	28680	JA1XGI
△OH1ZP	0630	14230	JA7BAL	N3BLB	1038	28680	JA1XGI
OH2DZ	0010	14230	JA1XGI	W3BWK	1744	28680	JA1PGH
△OH5ZJ	0520	14300	JA3GXD→7	WA6LGO	0904	28680	JA1XGI
OH9ZQ	0650	14233	JA1XGI	N8AEP	1010	28685	JA1XGI
SM5EUP	0615	14230	JA1XGI	W8WHD	1120	28685	JA1XGI
VK4AJS	1800	14236	JA1XGI	WØDQ	0753	28678	JA1PGH
XE1DDS	1430	14230	JA1XGI	PY2DRC	0945	28680	JA1XGI
YO8FR	1735	14235	JA1XGI	VK3IO	0900	28680	JA1XGI
ZL1LH	1755	14300	JA3XD→7	ZS6BTD	1759	28683	JA1XGI
△ZL4PJ	1600	14232	JG1DDT	WD4BEG→3	1035	28680	JA1XGI
WB5BST	0850	14235	JA1XGI	KH6SB	1225	28681	JA1XGI
KF5I	0830	14230	JA1XGI	LU4HSD	0835	28680	JA1XGI
KA6AEP	1500	14235	JA1XGI	LU5AN	0900	28680	JA1XGI
W6DQ	1538	14236	JA1XGI	PY2DAS	0910	28680	JA1XGI
W9PG	0820	14225	JA1XGI	PY4AJ	0715	28695	JA1XGI
K9ULD	0815	14225	JA1XGI	VK2BA	0700	28695	JA1XGI
△YO8FR→4	0632	14230	JA8DWY	△YV5AQS	0715	28683	JA1XGI
9V1QM	0032	14230	JG1DDT	ZL2AAV	0950	28680	JA1XGI
△ZS6FF	2305	21311	JA8DWY	ZL4PJ	0905	28690	JA1XGI
△HL1PW	1405	28683	JA1XGI		1803	28680	JA1XGI
AH2AQ	1506	14232	JG1DDT	OE3IBW→7	0512	14230	JA7BAL
AH2AR	0753	14231	JG1DDT	△OH5ZJ	1309	14232	JG1DDT
DF2GP	0656	14230	JA6DZI	YP2JPG→7	0630	14230	JR1UDK
DJ1IJ	0551	14230	JH8CFH	VK3BHZ	1911	14230	JG1DDT
DJ6QP	0511	14230	JH8CFH	△VK4APM	1840	14230	JA7BAL
G3WW	0244	14230	JH8CFH	YBØADI	1938	14230	JG1DDT
I2II	0511	14232	JH8CFH	ZL1LH	1713	14230	JA7BAL
I3XQW→7	0602	14230	JA7BAL	ZL2AUJ	1748	14233	JG1DDT
△I5HHZ	0650	14230	JA6DZI	ZS6BTD	0445	14226	JA7BAL
I5ZZZ	0552	14226	JA7BAL	DL8MA	0156	21340	JA8RC
KX6PO	2023	14230	JG1DDT	ON6UX	0140	21340	JA8RC
WB6QWC→7	1550	14230	JA6DZI	ZS6BTD	0030	21340	JA8RC
△LZ2NP	0727	14230	JR1UDK				
△DL8AC	0214	14230	JA8PPE	W7VAN	1706	14228	JA7BAL
△EA3CKF	0445	14230	JR1UDK	OE2JRM	0636	14232	JA7BAL
△EH2JO	0658	14230	JA1XVY	OH1XF	0121	14230	JA8PPE
△F6CLZ	0450	14230	JR1UDK	OZ9AU	0548	14230	JA7BAL
F8RR→4	2211	14230	JF1RYU	PA3BUR→4	0742	14230	JR1UDK
FR7AT	2243	14230	JA7BAL	△VK3LM	1856	14230	JA8DWY
△HB9CXN	0558	14230	JR1UDK	VK4ZG	0610	14230	JR1UDK
I5CYN→7	0541	14232	JA7BAL	△YB3ARP	1858	14230	JA8DWY
I5HOR	0550	14230	JR1UDK	YU5XKS→8	0600	14230	JR1UDK
△I6GI	0555	14230	JR1UDK	DF3SJ	2215	21340	JA7ACQ
I6GKI→8	0551	14231	JA7BAL	△ZS6BTD	1813	21340	JA8DWY
I6GMQ	0545	14230	JR1UDK	ZS2AO	2249	2249	JA7ACQ
△I8XYZ	0742	14230	JR1UDK				

⑦JR1UDK ④JA7BAL ⑦JR1UDK ⑧JR1UDK ⑧JA1XVY ⑦JA8PPE

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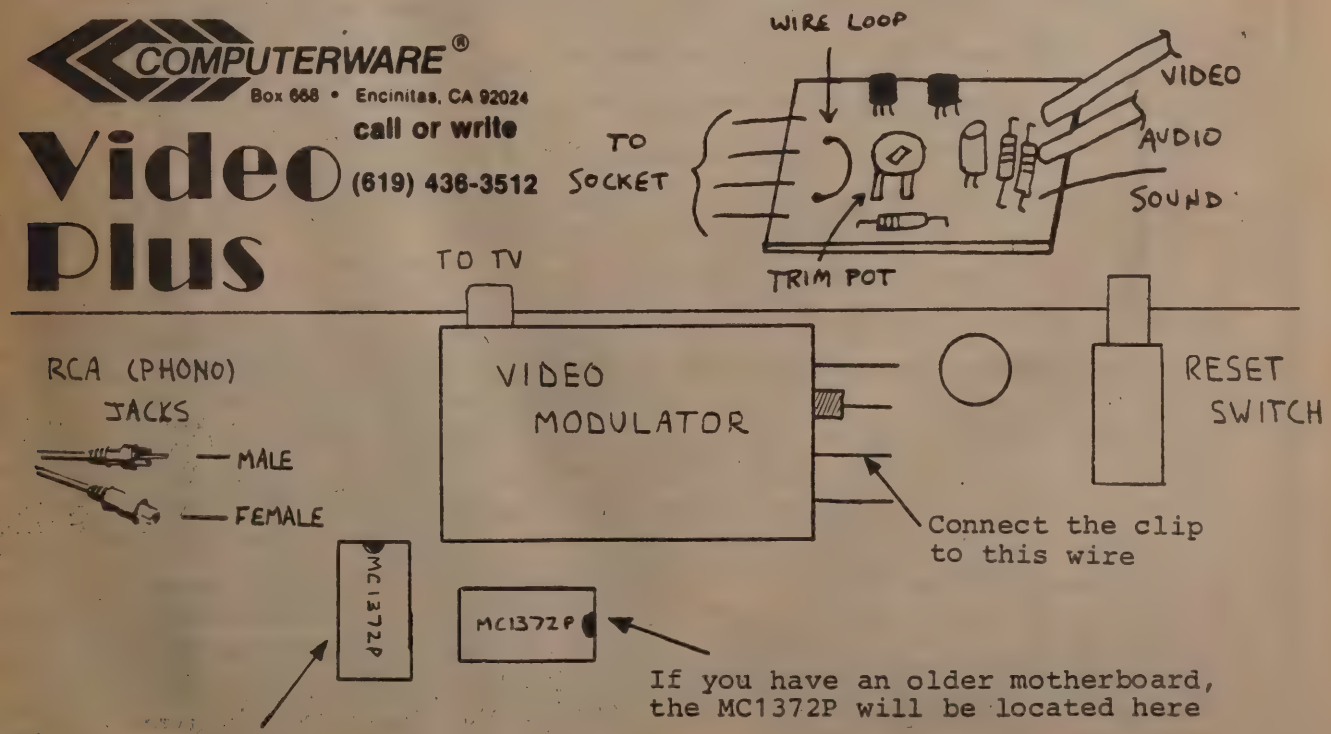

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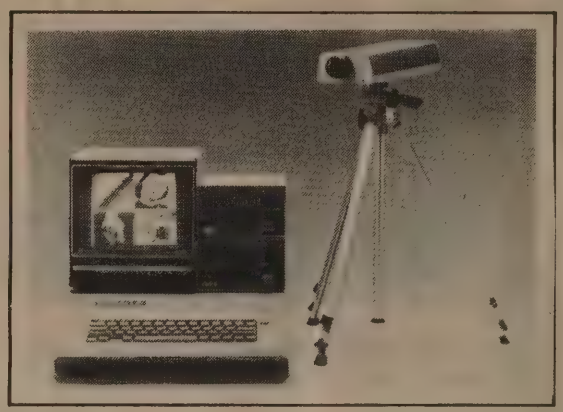

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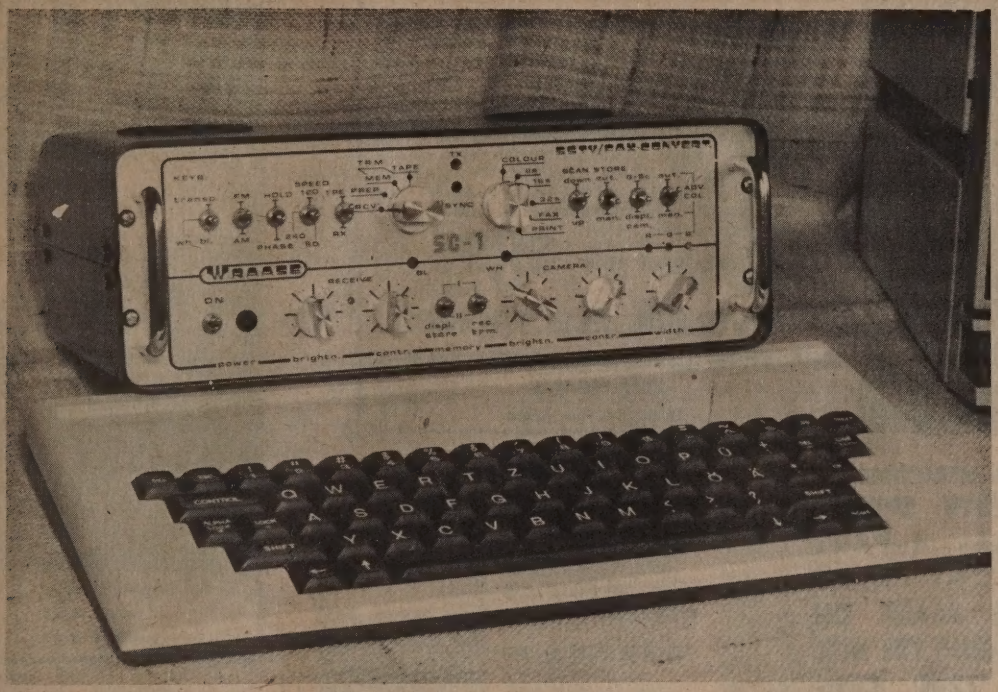

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See "A5 ATV Magazine" Review in March 1984 Vol. 14 No. 3

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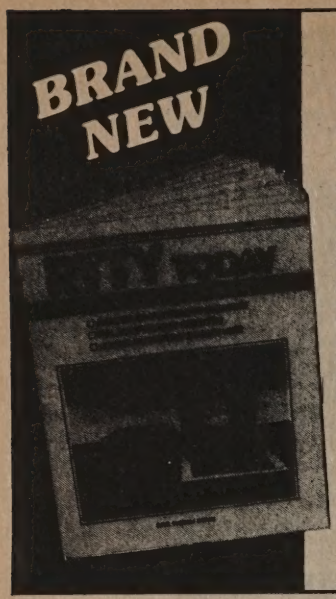

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December Vol. 14 #12

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- Interface Card Circuit

PART THREE

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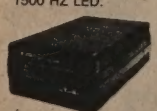

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ASSEMBLED	$38.95
PACKAGED with cables	$59.95

USA include $2.50 for shipping, handling, and insurance. CA sales add 6.5% Taxes
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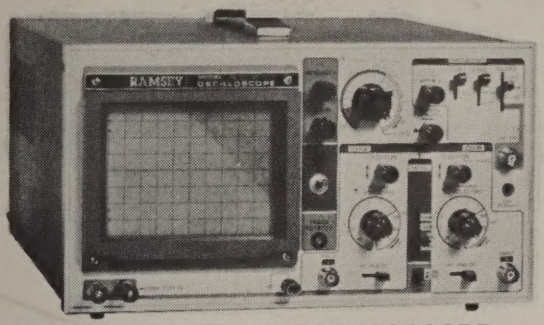
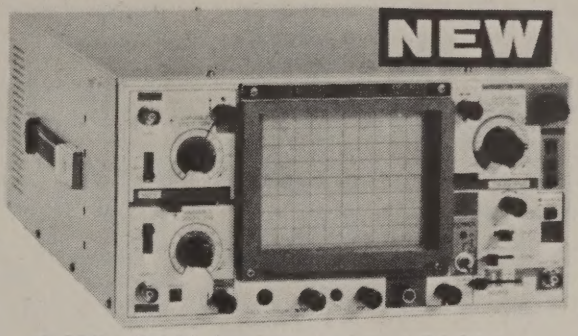


20 MHz DUAL TRACE OSCILLOSCOPE

Unsurpassed quality at an unbeatable price, the Ramsey oscilloscope compares to others costing hundreds more. Features include a component testing circuit for resistor, capacitor, digital circuit and diode testing. • TV video sync filter • wide bandwidth & high sensitivity • internal graticule • front panel trace rotator • Z axis • high sensitivity x-y mode • regulated power supply • built-in calibrator • rock solid triggering

$399.95 high quality hook on probes included

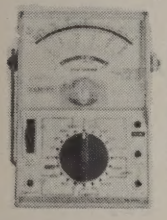
(See "A5" Review in July 84 Vol. 14 No.7 Issue)



45 MHz DUAL SWEEP OSCILLOSCOPE

The Ramsey 625 is a dual time base, delayed sweep unit that includes a built-in signal delay line to permit clear viewing during very short rise times of high frequency waveforms. Other features include; variable trigger holdoff • 20 calibrated sweep time ranges from 0.5 s/div to 0.2 μS/div. • fully adjustable sweep time • X5 sweep magnification • five trigger sources, CH1, CH2, LINE EXTernal and INTernal (V mode) • front panel x-y operation, Z axis input • sum difference of CH1, and CH2 waveforms displayed as single trace • sweep gate and sweep output • auto focus • single sweep

$799.95 high quality hook on probes included



RAMSEY D-1100 VOM MULTITESTER

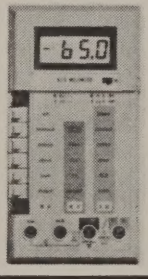
Compact and reliable, designed to service a wide variety of equipment. Features include • mirror back scale • double-jeweled precision moving coil • double overload protection • an ideal low cost unit for the beginner or as a spare back-up unit.

$19.95 test leads and battery included

NEW RAMSEY 1200 VOM MULTITESTER

Check transistors, diodes and LEDs with this professional quality meter. Other features include; decibel scale • 20K volt metering system • 3½" mirrored scale • polarity switch • 20 measuring ranges • safety probes • high impact plastic case

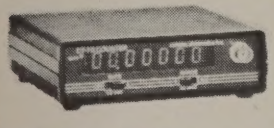
$24.95 test leads and battery included



RAMSEY D-3100 DIGITAL MULTIMETER

Reliable, accurate digital measurements at an amazingly low cost • in-line color coded push buttons, speeds range selection • abs plastic tilt stand • recessed input jacks • overload protection on all ranges • 3½ digit LCD display with auto zero, auto polarity & low BAT. indicator

$49.95 test leads and battery included



CT-70 7 DIGIT 525 MHz COUNTER

Lab quality at a breakthrough price. Features • 3 frequency ranges each with pre amp • dual selectable gate times • gate activity indicator • 50mV @ 150 MHz typical sensitivity • wide frequency range • 1 ppm accuracy

$119.95 wired includes AC adapter

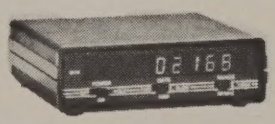
CT-70 kit $99.95
BP-4 nicad pack 8.95

CT-90 9 DIGIT 600 MHz COUNTER

The most versatile for less than $300. Features 3 selectable gate times • 9 digits • gate indicator • display hold • 25mV @ 150 MHz typical sensitivity • 10 MHz timebase for WWV calibration • 1 ppm accuracy

$149.95 wired includes AC adapter

CT-90 kit $129.95
OV-1 0.1 PPM oven timebase 59.95
BP-4 nicad pack 8.95

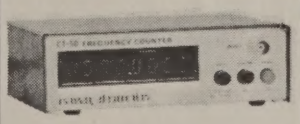


CT-125 9 DIGIT 1.2 GHz COUNTER

A 9 digit counter that will outperform units costing hundreds more. • gate inidcator • 24mV @ 150 MHz typical sensitivity • 9 digit display • 1 ppm accuracy • display hold • dual inputs with preamps

$169.95 wired includes AC adapter

BP-4 nicad pack 8.95



CT-50 8 DIGIT 600 MHz COUNTER

A versatile lab bench counter with optional receive frequency adapter, which turns the CT-50 into a digital readout for most any receiver • 25 mV @ 150 MHz typical sensitivity • 8 digit display • 1 ppm accuracy

$169.95 wired

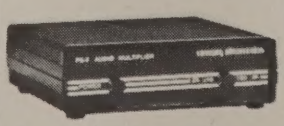
CT-50 kit $139.95
RA-1 receiver adapter kit 14.95

DM-700 DIGITAL MULTIMETER

Professional quality at a hobbyist price. Features include 26 different ranges and 5 functions • 3½ digit, ½ inch LED display • automatic decimal placement • automatic polarity

$119.95 wired includes AC adapter

DM-700 kit $99.95
MP-1 probe set 4.95

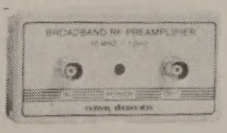


PS-2 AUDIO MULTIPLIER

The PS-2 is handy for high resolution audio resolution measurements, multiplies UP in frequency • great for PL tone measurements • multiplies by 10 or 100 • 0.01 Hz resolution & built-in signal preamp/conditioner

$49.95 wired

PS-2 kit $39.95

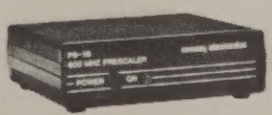


PR-2 COUNTER PREAMP

The PR-2 is ideal for measuring weak signals from 10 to 1,000 MHz • flat 25 db gain • BNC connectors • great for shifting RF • ideal receiver/TV preamp

$44.95 wired includes AC adapter

PR-2 kit $34.95



PS-1B 600 MHz PRESCALER

Extends the range of your present counter to 600 MHz • 2 stage preamp • divide by 10 circuitry • sensitivity: 25mV @ 150 MHz • BNC connectors • drives any counter

$59.95 wired includes AC adapter

PS-1B kit $49.95

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MODEL 5100-2 Vidicon Camera (B-W). 2/3" separate mesh. 10,000:1 ALC. 600 lines. White clip circuit. 120VAC. List $270. Your cost less lens $186. With 16mm F1.6 lens, $199.

MODEL 5100-6 Same as above but 24VAC version. Same prices as above.

MODEL TVC-999-2 Vidicon Camera (B-W). 1" tube. 0.5 ft candle sens. 25,000:1 ALC. 600 lines. White clip. UL listed. 120VAC List $320 less lens. Your cost $256. With 25mm lens $285.

MODEL TVC-5210-2SU Ultricon (Silicon) Camera (B-W). Very high sensitivity (.05 ft candle). 200,000:1 ALC. 600 lines. Int. EIA 2:1 interlace/External sync provision. White clip. "Operates on the light of a match!" List $900. Special discount cost less lens $675.

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Model TVM-90AC (Almond) 9" computer monitor $199.
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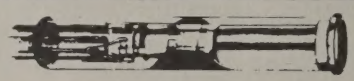

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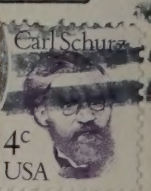

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